





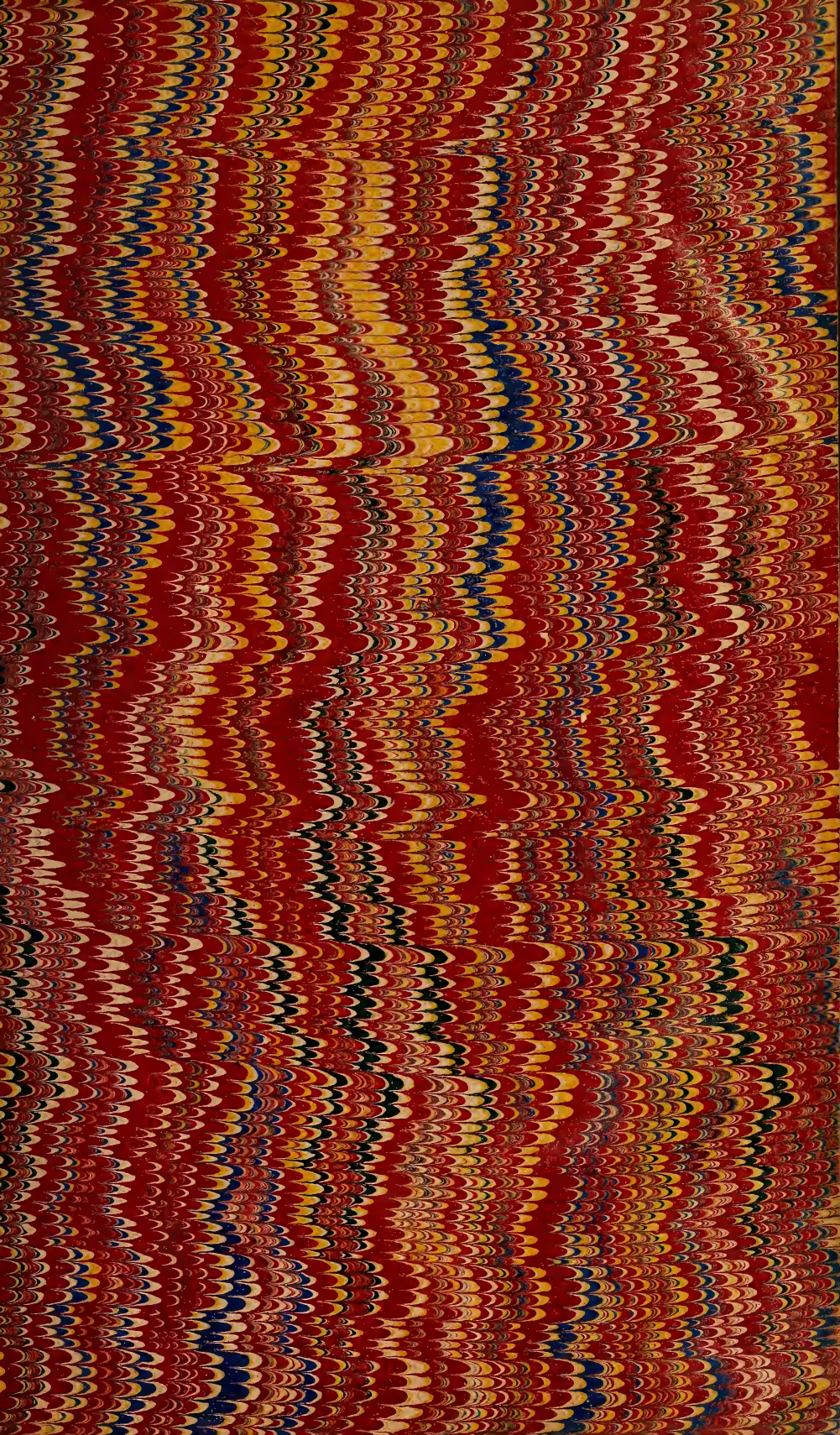
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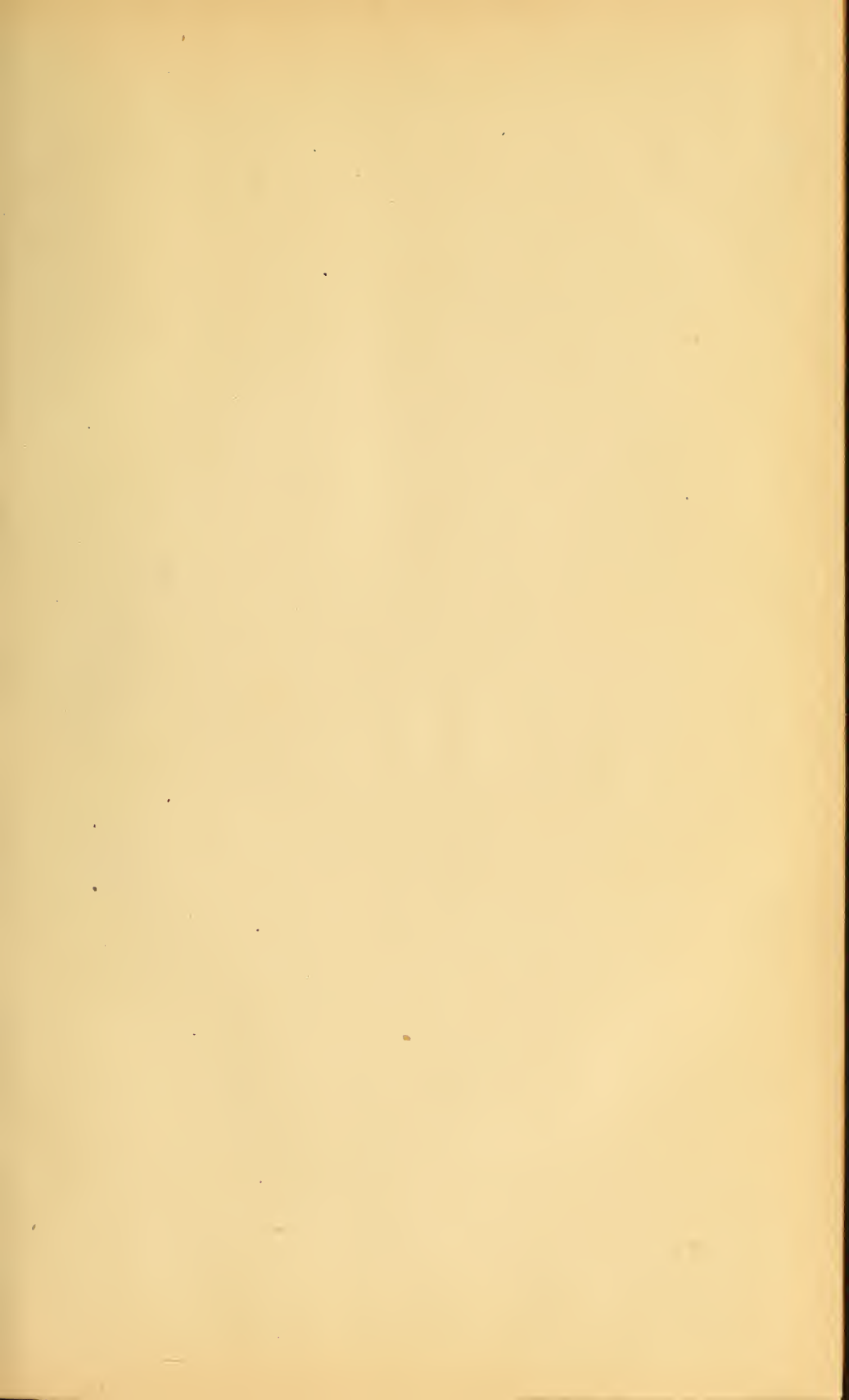
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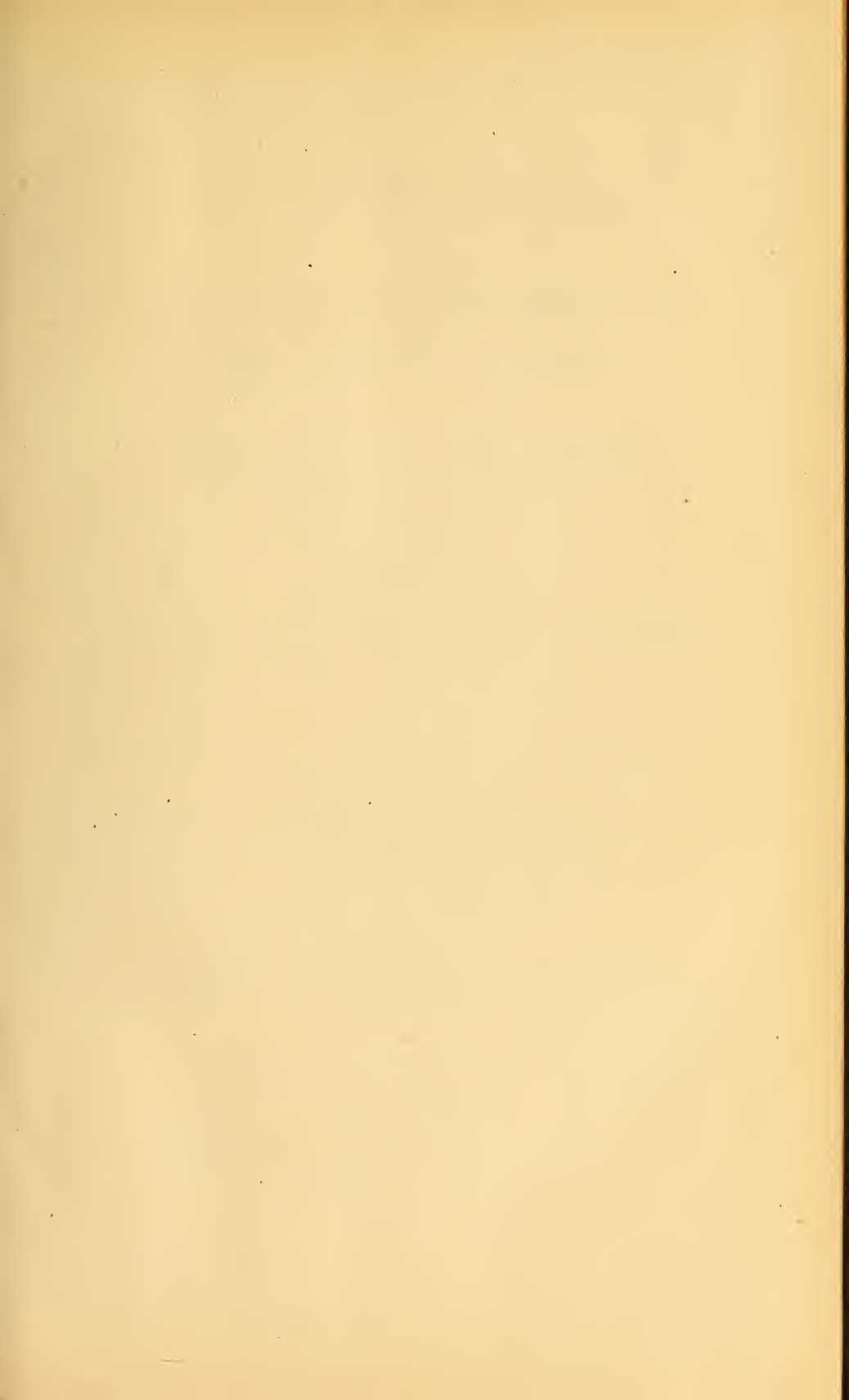
















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# HYDROPHOBIA:

MEANS OF AVOIDING ITS PERILS AND  
PREVENTING ITS SPREAD,

AS DISCUSSED AT ONE OF THE SCIENTIFIC  
SOIREES OF THE SORBONNE.

By *Emile Hant*  
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TRANSLATED BY

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## P R E F A C E.

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THE professional standing and long experience of Mr. H. Bouley of Paris have placed him as one of the highest authorities upon Veterinary matters on the Continent.

One of his pupils and admirers, I have for years been satisfied that one of the best means of preventing the spread of Hydrophobia was to make the people acquainted with the insidious and varied symptoms of that dreadful disease; and with this object only in view, I respectfully present to the public, with the kind permission of the author, this translation of his lecture on Hydrophobia, and trust that it will be the means of protecting many from this fatal malady.

A. LIAUTARD, M.D., V.S.

*New York College of  
Veterinary Surgeons,  
July 14, 1874.*





## HYDROPHOBIA.

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LADIES AND GENTLEMEN,—I can not but be deeply impressed with the occasion, on presenting myself in this celebrated hall, before an audience so large and so differently constituted from those which I am accustomed to address.

Nevertheless, I am both cheered and encouraged—cheered, for I know that, like those who have been here before me to fulfill a similar duty, I can count upon your sympathy; encouraged, as I possess the deep conviction that I am doing something useful.

Do not suppose that in taking for the subject of this address Hydrophobia in Animals, and especially in the dog, which for us is the most interesting, from his living with us in our dwellings, and on account of the intimacy of his relations to us, that I have any desire to satisfy a sentiment of mere curiosity on your part. No; my friend Jamin proposed to me to treat a subject connected with my specialty. I choose Hydrophobia, because I know, by my own personal experience and by thousands of established facts, that the best way to secure protection from this fearful disease is to show how it manifests itself, especially in its earliest stage—a period fraught with danger under harmless appearances, for even at this time it can be communicated. If, however, one is not observant, nothing, either in the expression of countenance or in the attitudes of the sick dog, will awaken suspicions. You may see

that he is not as he ordinarily is, yet this will not in any way cause you to suspect this fearful disease, *hydrophobia*, if you do not understand the meaning of what you see. It is this *meaning* that I hope to make plain to you, and, in so doing, am satisfied that I shall shield yourselves, your families, and friends from this fatal malady.

*What, then, is hydrophobia?* I must frankly confess that we do not know; and that, should one read all that has been written on the subject, he would not be the wiser upon this point. The nature of hydrophobia, up to this time, remains an enigma, and we know nothing of the seat of the disease. Yet we do know that which for us is a most important fact, namely, that this disease, the nature and the seat of which are so much involved in mystery, possesses the frightful quality of transmitting itself from the affected dog to other carnivorous and herbivorous animals, and also to man. It is, in other words, contagious.

It has, however, only one mode of transmission, and this is by inoculation; that is, to be communicated, the liquid which contains the germ must come in contact with a wound, which may be either deep or superficial, large or small, but containing blood-vessels and absorbents capable of taking up the poison.

All that has been told of the contagiousness of hydrophobia through the air as a medium, by the breath of those affected by the disease, or by emanation from the surface of the body, is utterly erroneous. Hydrophobia can be transmitted only by inoculation, and the only agent which has the power of communicating it is the saliva, in which alone the virus exists.

Any other liquid taken from a rabid animal is ineffective. Inoculation by blood, even its transfusion, has failed to produce any results.

All living beings affected with hydrophobia are capable of



transmitting it; that is, the saliva of all rabid animals is virulent, it matters not to what species they belong.

The intensity of the virulent property differs much in the different species. It is in the dog and the cat, and in all animals of the canine and feline families, that it is most developed. In the herbivorous animals the virus sensibly diminishes in force. To such an extent is this true, that experimental inoculations with saliva from herbivorous animals frequently remain without results, while positive results follow inoculation with the saliva of carnivorous animals in the majority of cases. Man is allied in this respect to the herbivorous animals; his saliva is virulent, as has been demonstrated by experiment, but to a less degree than that which characterizes the *carnivora*.

It is not only because their saliva is less virulent that herbivorous animals are less dangerous than carnivorous ones, but because they have other habits and instincts. Thus, when an herbivorous animal, obeying the irresistible impulses of hydrophobia, becomes aggressive, it is not with its teeth that it will first attack. If he belong to the ox, sheep, or goat tribes, he will attack with his horns, and in this case the wound may be serious, but not harmful, so far as inoculation with hydrophobia is concerned.

It has been said that cats have communicated the disease by scratches made with their claws. If such is the fact, it can not be explained except by the presence of saliva upon their claws, or by their simultaneous spitting. But no blow from the horn of an ox, buck, or ram, no matter how furious the disease may have made him, can ever communicate hydrophobia.

Although, at first, from their natural tendencies, the herbivora are not generally disposed to bite, yet the rabid impulse may force them to it. This is true of the horse more than of any other, for, physiologically, he is inclined to use his teeth as a means of defense. But even when a rabid herbivo-

rous animal uses his teeth, his bite is less dangerous than that of the carnivorous, inasmuch as his teeth are less apt to wound, because they are not adapted to penetrate the flesh, especially not through the clothing, and also because their saliva is less virulent, as has been before stated.

## HYDROPHOBIA OF THE DOG.

### *Canine Rabies.*

People generally imagine that when a dog is "mad" his disease is immediately characterized by furious manifestations and frantic movements; that he becomes suddenly more ferocious than a tiger or a jackal; that he is actuated only by unnatural impulses suddenly developed, which irresistibly urge him to bite and tear those who come near him, even those of whom he is most fond.

This is a false idea. The disease is not characterized, in the first period of its manifestation, by acts of fury or madness. Often quite the reverse takes place. An affectionate dog will not become ferocious and estranged in a single day. It is by slow degrees that the transition comes.

*But even in that first period, mark well, from the moment that the first symptoms of hydrophobia show themselves, the saliva of the animal is virulent.* Already his caresses may be as dangerous as his bites.

Let us be well impressed with this terrible truth; for it is a dangerous prejudice which holds that hydrophobia is invariably and necessarily characterized by rabid symptoms. Of all prevailing notions relating to this strange disease, this is perhaps the most fruitful of disaster, for it does away with precautions and care regarding diseased dogs which show no tendency to bite.

Hydrophobia in its early stages has always an appearance of entire harmlessness, but, with all this, it nevertheless possesses its fearful property of virulency.

I will endeavor to describe the disease to you, by its most prominent characteristics, and in its successive periods.

A.—*Symptoms presented by the External Appearances.*

At the initial period of his disease the disposition of the "mad dog" changes. He becomes quiet, sad, taciturn; he seeks quietness, likes retirement and obscurity, and conceals himself in the corners of rooms and under the furniture. But for him there is no rest; he has hardly curled himself up in that comfortable position natural to the dog seeking repose, when suddenly he rouses himself with a start, and going hither and thither in the room, soon again assumes a position in which to go to sleep. In a few moments he changes again, and so on. The animal is in a constant state of anxiety and agitation, which is so different from his usual condition that it is almost certain to arrest and fix the attention of the observer.

At this stage he does not show any inclination to bite. He remains good-natured, and obeys the voice of his master, although he does not do it with his usual alacrity, nor with his usual expression of countenance. If he wags his tail, the motions are slow and his looks are peculiar. If his habitual expression be momentarily awakened by his master's voice, it soon passes off, and he looks as if suffering from deep sadness. As soon as the poor dog is no more under the influence of the excitement of his master's presence, he returns to his solitude, and to what may be called his own sad thoughts.

These preliminary symptoms are more and more developed as the disease progresses. His agitation increases. If his bed be of straw, he scratches it all around; if he be in the house, he turns over the cushions and mats upon which he habitually lies; yet nowhere can he find rest; and he constantly goes and comes, scratching the floor and snuffing in the corners and under the doors, as if he were looking for something, or bent upon some quest.



There is a very remarkable peculiarity of this early stage, which Youatt was the first to observe and describe. I refer to a certain aberration of mind, which leads the poor dog to see, fear, and feel imaginary objects, being subject to hallucinations. When we observe a mad dog with attention, without disturbing or exciting him, by his motions and actions we may assure ourselves of the nature of his sensations. Sometimes he will remain motionless, listening and watching for something; then, at once, he will start, run forward, and snap in the air as if trying to catch a fly. At other times he runs furiously, and howling against a wall, as if he had heard noises of some kind on the other side. What is the significance of these acts, which are perfectly controlled by the will of the animal, if they are not simply hallucinations?

The dog, like the man, affected with hydrophobia, sees and hears imaginary foes; and he runs after and bites at them, as if they were realities. But do not suppose that, though he may be inclined to use his teeth against the objects of his fancy, and throws himself into such aggressive attitudes, the frenzied passions are already developed in him. No. At this stage of the disease the dog is still tractable and submissive. His master's voice is enough to rouse him from his dream.

I have already said, and allow me to re-assert this fact, that at the first the dog is not raving mad, as is generally supposed; but this does not adequately present the truth. I must mention a more serious circumstance. The dog is not only not aggressive toward those to whom he is attached, at the outset of the disease, but, on the contrary, he appears drawn toward them, and his affection seems to increase in proportion to his sufferings. At times his instincts draw him near his master, and he appeals to him for relief. If he be permitted, he will express his gratitude for the care bestowed upon him by his caresses, that is, by licking the hands or even the face.

How perfidious are these caresses! As surely as his bites

they are capable of inoculating the hydrophobia, if the tongue, moistened with his virulent saliva, comes in contact with some abraded or excoriated portion of the skin. In such a case the smallest scratch is a door open to death—and what a death!

The affectionate feeling of the mad dog toward his master is so powerful and enduring, that it governs him even in the raving stages of his disease. It controls him, and even his fatal desire to bite is overcome by an effort of his will, or rather by the power of his attachment. In this the nature of the dog seems almost human; for man under similar diseased circumstances is conscious of the harm he may inflict, and is careful to avoid it.

Thus the mad dog generally respects his master, and spares him his bites even in the most rabid phases of the disease; and the owner or master almost always has a powerful influence over the dog, sufficient in numerous cases to compel the madness of the animal to remain *latent*, so to speak, and not to manifest itself by rabid symptoms and the desire to bite.

The foregoing is another of those remarkable facts which increase the safety of those who, as friends or neighbors of the family, would be exposed to the first attacks of a mad dog. As long as his master can control a dog by his presence or his voice, his ferocious tendencies may be kept under, and the animal will remain quiet and gentle, and may perhaps even be approached and coaxed by strangers, though this is very dangerous. His habits of submission and his attachments prove stronger than his rabid instincts.

I have often observed these facts in the hospital yards of the Veterinary School of Alfort, in cases of dogs kept chained by their masters, without being muzzled. Though having hydrophobia, they would nevertheless remain perfectly inoffensive, on account of the presence of their owners, in the crowds of visitors which are always there. These same dogs would exhibit all the symptoms of hydrophobia as soon as separated

from those they knew. The cases are numerous that I have collected, or that are recorded, of mad dogs left free in the homes and living in the intimacy of their masters' families—sleeping in their rooms, even on their beds; still doing no injury to members of the household, not even to the children, in spite of their teasing. And this for a period of one, two, or three days, which is a sufficient time for the disease to reach its wildest paroxysms.

I will go so far as to say that even in this last named condition, when the dog is *mad*, and allows his fury to have the mastery of his actions, the voice of his master has its influence; yes, his commands are obeyed, and, if the dog hear, it will be enough to quiet him for an instant. He will manifest his feeling by the wagging of his tail, and by an affectionate glance rapidly passing through his furious and glaring eyes.

That friendly and loved voice which the poor dog understood so well before being the prey to this terrible disease, can so influence him as to call him back when running away, and roaming unrestrained about through yards, gardens, and highways, perhaps having already committed acts of ferocity. Even thus, when apparently beyond restraint, instances are not rare when the dog has answered to his name when called by his master, and come to him submissive and tamed, so far as to allow him to place a chain upon his neck. This is a happy circumstance, by means of which many accidents may be prevented, since the owners of rabid dogs running free, and committing furious excesses, may, by controlling their own fears, accomplish much good, through this sort of immunity from danger. That they do thus run some personal risk is true; but it is also certain that under ordinary circumstances they are the least exposed to danger.

With these facts in view, we can judge how erroneous the notion is, that from the beginning the mad dog is furious and rabid. Far from it—and, on the contrary, it is not the bites



of a mad dog that are at first to be feared, but his caresses, which we call his POISONED KISSES. To reiterate, let me say,

*Beware* of a dog which begins to be sick. All sick dogs, as a principle, must be suspected :

*Beware* especially of one which is sad, morose, and seeks for solitude ; which does not know where to rest ; which goes and comes, rambles about, snaps and barks without reason ; whose looks are dull and gloomy, and whose bright expression is lost :

*Beware* of the dog which looks about and attacks imaginary phantoms :

*Beware* of one which is suddenly too affectionate, asking for your caresses by his pitiful and repeated cravings :

And thus you will protect yourselves from dangers to which you may be exposed in your homes by dogs kept as family pets.

#### B.—*Symptoms affecting the Digestive System.*

Among all the prevailing opinions concerning hydrophobia, one of the most common is, that there exists a horror of water. When a sick dog has not the fear of water, he is not regarded as mad. This is a serious error which should be eradicated, as it has been the cause of numerous disasters. Nevertheless, the occurrence of the symptom is an admitted characteristic.

The mad dog is *not* of necessity *hydro-phobic*. He is not afraid of water, and he will not run away if one were to offer him a drink. So far from this, he will come to the basin and lap with avidity. In the first stages of his disease he will drink, and after the contraction of his throat renders deglutition impossible, he will still try to drink. His lappings become oftener repeated and stronger, and at the same time less efficacious. He is even seen often, as if in despair, to thrust his whole nose into the basin, and to bite the water (so to speak), which he sucks up uselessly, and which he can not swallow. Is not this a torment worse than that of Tantalus ?

Rabid dogs have so little fear of water, that they have been

known to swim across rivers, in order to attack, in their rage, flocks of sheep which they had seen from the opposite shore.

At first the mad dog (generally speaking) does not refuse his food, and some exhibit unusual voracity when it is placed before them. Some, however, completely lose their appetite. We may often observe a remarkable fact, and one thoroughly characteristic either of a depraved appetite or of an inordinate desire to bite. We see the dog lay hold of, tear, bruise, and swallow numerous objects entirely unfit for food, such as his bedding, the wool of cushions, blankets, curtains, slippers, wood, grass, earth, stones, glass, the excrement of horses, of man, even his own—in short, any thing he can get; and in the post-mortem examinations of mad dogs we often find a mass of foreign bodies in the stomach. These differ greatly in their nature, and exhibit the marks of his teeth. The fact alone of the presence of these bodies is sufficient evidence to establish the strong presumption of the existence of hydrophobia.

This being known, we must be on our guard when a dog in a room tears with obstinacy the carpets, blankets, etc.; when he gnaws the wood of his box, eats the earth in the garden, and his bedding, usually without exhibiting any ill-feeling toward persons.

Persons not attacked by such a dog remain almost always without fear, because they do not understand the significance of such strange actions. Nevertheless, no symptoms are more important, because they are the precursors of others. The animal at first satisfies his growing, rabid furor upon inanimate bodies; but the time approaches when man himself will not be spared, and when the dog, perfectly delirious, will bite even his master, regardless of the affection he may have for him.

It is generally believed that the mad dog salivates abundantly; that he “froths at the mouth;” that without this sign a dog need not be regarded as mad. This is also a serious

error. The salivary secretion is increased during hydrophobia only when the disease is at its paroxysms, but previous to this nothing indicates that there is a greater flow of saliva than in the natural or physiological state; that is to say, a dog may be mad, and yet no saliva flow from his mouth.

I will now direct your attention to another symptom, less common than those I have reviewed, but very important, considering the fearful mistakes to which it may give rise.

In certain conditions of hydrophobia, difficult to specify, the mouth of the dog remains open, because, the muscles of the lower jaw being paralyzed, it can not be closed. In this case the lining membrane of the mouth becomes dry under the influence of the air, and takes a dark red tint, and is covered in spots by a brownish dust like dried earth, which adheres conspicuously to the upper surface of the tongue and upon the lips. The expression of countenance that the animal has, on account of the forcibly opened jaws, and the dark color of the inside of the mouth, is rendered more noticeable from the characteristic expression of the eyes, which becomes dull and gloomy. In such a condition the animal is not very dangerous of himself, for he is disarmed—he can not bite; but remember, his saliva is nevertheless virulent, and should you inoculate yourself by imprudent handling of his mouth, you will become as fatally affected as if inoculated by a bite.

There is a serious danger against which all should be on their guard, namely, that of exploring in the mouth and throat of the dog with the fingers, to find if the obstacle to the closing of the jaws may not be a bone lodged between the teeth or in the pharynx. This is the first idea that presents itself when the significance of other indications is unknown; and, if the animal be a pet, one wishes particularly to relieve him of the supposed cause of suffering. Remember, his saliva may be virulent, and if the fingers have the slightest scratch, or if you wound yourself against his teeth, or if, as may possibly happen,

the animal closes his jaws by a convulsive motion and bites, the disease may be communicated, and fatal consequences are likely to follow.

The past reveals too many such cases; therefore *always* suspect a dog whose jaws remain open, for it may be the indication of hydrophobia, characterizing either the dumb or the furious form of rabies. It is an undoubted symptom of both forms, and in both we should avoid the contact of our hands with the saliva.

Another suspicious symptom proceeds from the sensation of constriction and obstruction of the throat under the influence of a rabid spasm, and from the dry condition of the mouth. I allude to the motion that the dog sometimes makes with his fore-paws on each side of his mouth against his cheeks, as if to relieve himself of the obstruction—the supposed bone lodged in his throat or between his teeth. In this case, also, mistaking the meaning of these motions, one would be disposed to relieve the poor animal, who by signs thus indicates the seat of his distress, and who seems to indicate the cause. But be cautious, and do not yield to the kindly impulse, for the exploration of the throat and jaws will be by so much the more dangerous as the dog is quite able, and from the irritation may be inclined, to bite.

Had I purposed to describe every thing connected with the history and study of canine rabies, the time would have arrived to consider the peculiar little lumps or blisters which have been discovered beneath the tongue on each side of the frænum, in the incubative period of the disease. But their importance is not real. These “lysses,” as they are called, constitute only a symptom, and this too hidden to serve to recognize the ailment.

Among the symptoms exhibited by the digestive apparatus there is one which is of quite exceptional occurrence, and consequently liable to be misinterpreted. This is, blood-stained



vomiting, which arises from wounds made in the mucous membrane of the stomach by hard bodies with sharp angles which the animal has swallowed. One should be on the lookout for this symptom, and, exceptional as it is, bear it in mind as indicating the possible existence of rabies.

At this point I wish to say that, when investigating a case of internal disease of any kind in dogs, it is always prudent to protect ourselves against the possibility of rabies—to consider as a principle the case as suspicious, and to act accordingly. So far as my own practice is concerned, I have for many years adopted this course, and to it I attribute the immunity I have enjoyed during my long clinical life.

*C.—Symptoms proceeding from the Voice.*

The bark of the mad dog is thoroughly characteristic; so much so, indeed, that any one familiar with it can decide with certainty the presence of a rabid dog when this barking is heard. It is not necessary either that the ear be long exercised to familiarity with the sound, to obtain this certainty of diagnosis.

Any one who has heard the howling of a mad dog once or twice, is so much impressed by the fearful meaning of the sound that he never forgets it; and when at any future time the same sound reaches his ear, he can not be mistaken as to its significance. I am sure I can not describe to you this rabid howling so as to give a clear idea of it. I ought to have the power of imitation, which, unfortunately, I do not possess. I must therefore confine myself to saying that the voice of the dog is wonderfully modified in its tone and expression. Instead of the normal and successive barks, it is hoarse, lower in tone, prolonged, and not so strong. After the first bark made at full strength, a series of five, six, seven, or eight others immediately succeeds, lowered in strength and thrown out from the throat. During the utterance of these barks, the jaws are only partly,

instead of entirely closed at each bark, as in the ordinary healthy voice.

These prolonged barkings have something dismal and portentous about them, when they are understood, which impresses every one; and it is not unlikely that the bad omens which, according to popular prejudices, are incident to the howling of dogs at the moon, have no other foundation than the remembrance of disasters caused by rabid dogs, which during the night before they went mad were thus uttering their fearful howlings.

The description I have just essayed can only give you a very imperfect idea of the rabid bark; but the important point is to convince you that there is always a radical change in the voice of a mad dog—that his barking is entirely different from its normal tone. We must always be on our guard when the well-known and familiar voice of the dog is suddenly altered, and possesses strong and different sounds, which awake suspicion by their strangeness.

To convince you of the truth of these statements, I will relate an authentic occurrence, showing the great value to be attached to a knowledge of this modified barking of the dog as a symptom of hydrophobia.

Some years ago two veterinary students, returning to the school at Alfort about nine o'clock in the evening, heard this hydrophobic howling uttered by a watch-dog in a house, near which they were passing, in the village of Charenton. They immediately went to the house, and notified the owner of the danger he was exposed to. Fortunately, the gentleman listened to their warning, and the dog was tied up and secured for the night. The next morning he was brought to the clinic of the school. The students were not mistaken. I at once recognized the dog as mad. His master could not believe it; he could not understand how this animal, so quiet, affectionate, and obedient, could be afflicted with such a fearful disease. Such was the fact, however, and soon after he was placed in the cell

the rabid symptoms presented themselves in the most positive manner.

The students could hardly be too highly complimented for their promptness. They doubtless prevented most serious consequences; for the dog which betrayed his malady by his barking was of large size, and if he had been allowed his liberty, as was usual, what terrible results might have followed. How important, then, it is to recognize this precursory sign given by the voice.

However, all mad dogs do not howl. Some from the beginning remain dumb, and it is from this fact that this form of the disease is called "*dumb rabies*."

In that particular manifestation of the disease, already alluded to, in which the paralysis of the lower jaw is the essential characteristic, as a consequence of this paralysis, with that of the vocal organs, we have dumbness, simply because the emission of sound is mechanically impossible.

Furthermore, dumb rabies differs from raving rabies, if I may be allowed the expression, in a *moral* point of view. Not only do his set jaws prevent him from biting, but the ferocious instincts are wanting, and he has no inclination to bite or attack in any way.

So, then, dumb rabies would be almost harmless to others, provided people would not, from charitable motives, manipulate the sick animal's mouth, looking for the imaginary bone which, in their view, prevents his closing it, and thus inoculate themselves.

If dumb rabies be regarded as a mild type of the disease in view of its symptoms, these bear no relation to its intrinsic virulency—a fact which I am desirous of impressing upon your minds.

#### D.—*Symptoms affecting the Nervous Sensibility.*

Contrary to what is observed in man with hydrophobia, the nervous sensibility of the dog seems to be considerably weak-

ened, or he appears to have lost the faculty of expressing his painful sensations.

The mad dog is dumb under the infliction of pain. It matters not what suffering may be inflicted, he neither makes known his pain by his nasal whine (the first expression of complaint of the dog), nor by the acute howl, by which he expresses the most violent suffering. Whipped, pricked, or burned, the rabid dog remains dumb, though he is not insensible. The instinct of self-preservation and protection still exists. If the bedding under him be set on fire, he rushes away and conceals himself in some corner. If a bar of red-hot iron be presented to him during the period of delirium, he will spring toward it, bite it, and start back immediately after taking hold of it. If the burning iron be applied to his paws, he will run also; and it is evident from all these facts that he suffers—the expression of his face tells us of his pain; but, for all that, he does not whine, nor does a moan escape him.

If, however, nervous sensibility is not destroyed, as is clear from these experiments, it is evidently diminished.

When burning tow is thrown under him, he does not run away immediately: it is not until after serious burns are produced. Some dogs, though they are few, will seize and hold the red-hot iron bar. We are authorized by these facts to conclude that mad dogs do not perceive painful sensations so quickly as those in a state of health; and this shows us why it is that they sometimes vent their rage upon themselves.

Allow me to narrate a single incident, to my mind a conclusive one. Years ago I was called to visit a spaniel which had at the base of the tail a small, fresh wound that had made its appearance but a few hours before. The animal appeared sprightly, and obeyed the voice of his master, coming to him wagging his tail. Nothing made me suspect hydrophobia; and I was deceived so much the more easily because I did not know this disease, except in its period of exacerbation and



rage, as it was always thus described. I took the wound for one of the skin diseases so common in dogs, and prescribed accordingly; recommending, however, as a measure of cleanliness, not to allow the dog to sleep in his master's apartments or upon the bed, as had been his wont; so he was left upon the mat in the hall. The next morning the servant found at the foot of the stairs the tail of the favorite entirely separated from his body; and it was the dog himself which had inflicted this mutilation. Surprised and disgusted at such conduct, the owner, without suspecting the cause of such an act on the part of the dog, ordered him to be brought to the clinic at Alfort. The dog walked the whole distance without exhibiting any extraordinary symptom, and without attracting any suspicion on the part of the man who led him. When he came within the hospital yard, this dog, with his tail off and bleeding, his mouth bloody and his eyes staring, possessed too characteristic a physiognomy for me not to recognize at once his malady. He was placed in a cell, where, under the excitement of the barking of other dogs, a paroxysm of madness soon came upon him, and two days after he was dead.

We see in this case the principal features of rabies in its early stage. This friendly dog, so governed by affectionate feeling, and so much under home influences, although the desire to bite was well developed in him, satisfied the impulse to bite upon himself, without serious suffering, his master and the domestics escaping unharmed. He was even quiet and obedient toward the man who led him during his journey from his home to the hospital, and only gave way to a fit of madness after being separated from his conductor and placed in a cell by himself.

This is one of the most curious and instructive facts connected with this subject.

From the foregoing statements relative to the lack of sensibility possessed by the rabid dog, we are led to the following

conclusion: We must look out for and suspect all of this species which remain insensible to pain to an unnatural degree, and who bear punishment without whining or moaning. When, for example, a dog is pursued in any locality because he is unknown and without a master, if he remain silent notwithstanding the punishment inflicted, beware of him; he is suspicious. Beware of the dog which bites himself with persistency, and does not desist on account of the pain he inflicts. You may suppose that it is because he can not resist the tendency to bite induced by some of those itching diseases so common to the dog. Of course this may be the case, but there is a possibility that it may be an intimation of an impulse to bite developed in him, or perhaps the irritation produced by the rabid virus in the wound where it was first deposited. At least the symptom ought to have sufficient significance to put us on our guard.

I come now to the consideration of a symptom peculiar to the rabid state of the dog and other animals (man, perhaps, excepted). It is a symptom of great importance in relation to the diagnosis. I speak of the impression produced on the mad dog by the sight of another animal of the same species. This is so powerful and so efficacious in giving rise immediately to the manifestations of a paroxysm, that it may be said truly to be the surest means of developing a latent case of hydrophobia. In hospital practice this method is pursued every day, to remove doubts in cases where the diagnosis is uncertain, and seldom does it prove unavailing. As soon as the dog which is really mad is brought into the presence of another dog, he will make an aggressive attack upon him and bite him with all fury.

*Peculiar Effects.*—This excitability, which is altogether peculiar to the rabid conditions, does not belong exclusively to the dog. All mad animals, with the exception, perhaps, of man, are impressed similarly by the sight of a dog. They

become excited and exasperated, or raving, and run toward him and attack with their natural weapons—the horse with his feet and his teeth; the bull and ram with their horns; even the sheep, throwing off its natural pusillanimity and timidity at the sight of a dog, will rush upon one and attack him, treading him down. Is not this a change of rôle? I beg permission to repeat to you two clinical cases, which will remain in your minds, as demonstrating the powerful excitement produced in all rabid animals by the sight of a dog.

Some five-and-twenty years ago, a very handsome hunting-dog was brought to Alfort in a two-wheeled cab. He was placed unmuzzled under the driver's box. During the whole journey, notwithstanding the excitement that a strange person might produce on him, he remained inoffensive. The cab reached the hospital, and the dog was brought into my office in his owner's arms. The gentleman told me that for two days the animal had been sad, morose, and refused to eat. Not being so careful then as I am nowadays, I took the dog on my lap to examine the condition of his mouth, when a little poodle which I owned came into the office, and, as soon as he was seen by the sick dog, the latter jumped down, without any attempt to bite me, and rushed toward the poodle, which was lucky enough to escape. This unexpected movement, so entirely foreign to the disposition of the dog, as his owner testified, was enough to lead me to suspect hydrophobia. The dog was therefore isolated, and died on the third day of that disease.

The other case was one of a horse, which had been brought to my consultation. The animal had had a difficulty in swallowing liquids for two days previous. He appeared to be, and in fact was, of an extremely quiet disposition. I opened his mouth and took hold of his tongue to examine it, when the same poodle came around me. As soon as the horse saw him he freed himself from my hands with a jerk, and ran, mouth

open, after the little animal, which again made good his escape.

Remarkable indeed; yet this horse was exceptionably quiet toward man. Obeying the voice of his master, he would quietly follow him without leading; and even after this aggressive demonstration, he continued perfectly harmless toward the surrounding people. The owner then said that he had behaved in the same manner once on the way over; but he attached no importance to the occurrence, and therefore would not have mentioned it, except for this repetition of the action. This was enough to clear up the case. The animal was securely tied between two trees with a double halter. Several times the experiment of rousing his rage was repeated, and under the influence of those excitements hydrophobia soon manifested itself in its worst paroxysms, and in a few hours ran through all of its stages, and the suffering animal fell down exhausted, and died shortly after.

Thus it is beyond a doubt that the presence of an animal of the canine species increases the nervous susceptibility of rabid animals, awakening them from a quiet condition, and producing aggressive demonstrations, which increase in intensity in proportion to the number of times the excitement is repeated.

This is a fact of such constancy that it may be considered the expression of a fatal law, the secret reason for which is beyond our knowledge. However, this law has had an exception—a very remarkable circumstance.

A horse which M. Renault, director of the School of Alfort, had inoculated with the virus taken from a rabid sheep, contracted the disease, and exhibited very strong and peculiar symptoms. He turned his rage upon himself, and would bite and tear his fore-leg with his teeth. Nevertheless, this animal, though in such a high state of rabid excitement, was not furious toward a dog. The sight of a dog had no effect, and one thrown to him was not only spared, but he pushed him



away with his nose without hurting him. When, however, a sheep was presented to him, a terrific paroxysm of rage seized him, and, taking hold of it between his powerful jaws, he killed it in an instant, crushing it with his teeth.

It would appear from this fact, which unfortunately is the only one observed and recorded of its class in the annals of science, that animals which have been inoculated by a bite or by any other means, will only exhibit their peculiar fury in the presence of an animal of the same species from which the virus was taken.

But it is better not to discuss this fact. I merely relate facts, and believe it prudent to abstain from entering into any speculations upon them. From these accounts it is evident that, with the exception related, it is one of the canine family that produces the spasms of excitement in rabid animals. You will understand the importance of this fact, and how useful the knowledge of it is, if the owners of dogs would profit by it. We have frequently proof elicited, by questioning persons owning rabid dogs, that these animals have been greatly excited by the sight of one of their own species before attacking man; but unfortunately, in the majority of cases, this peculiarity, significant as it is, does not arouse the attention of the observer, nor excite suspicion. This is because the owner and his friends at the house have noticed nothing peculiar or unusual in the disposition of the dog, unless the presence of other dogs rendered him peculiarly cross and vicious.

Beware, then, of the dog which, contrary to his habits and natural disposition, becomes suddenly aggressive toward other dogs. Such manifestations are very significant; every one should be convinced of this, for if one knows how to interpret the action, he may protect himself and others from the fatal consequences of this disease, of which these signs are the infallible precursors.

It appears evident from these facts that in the majority of

cases of rabies occurring in pet house-dogs, they remain harmless toward persons around them during the early periods of their rabid condition. Controlled as such dogs are by their affectionate regard for their friends, I am inclined to believe that the poor beasts strive to obey these nobler impulses, when, before giving way to the disease, they run away from home and disappear. It seems as if they were conscious of the harm they might do, and, to avoid inflicting this injury, they run away from those they love. However correct or incorrect this interpretation may be, it is certain that the mad dog leaves his master, and goes and dies in a solitary spot; or, which is more common, he is recognized for what he is, in some populous locality, by the atrocities he commits both on men and beasts, and he meets death in his way.

In some cases, by far too numerous, the poor brute, after wandering for one or two days, and having escaped pursuit, returns home; thus obeying a fatal attraction. It is at this stage of things that accidents are most to be feared. On his return every one runs to meet him, in order to help him, for he is generally in a most miserable state, covered with mud and blood; but woe to whoever approaches him at this period of the disease. The desire to bite overpowers his affectionate feelings, no matter how strong they may be. Too often, for the kindness shown him, he will return treacherous bites with their fearful consequences.

We must consider that dog as very suspicious which, after having left his home, returns, and especially if he be in the miserable condition stated above.

I have enumerated successively the signs, the symptoms, and the peculiarities of the rabid dog in the early part of the disease; and I hope I have sufficiently impressed upon you this salutary conviction, that hydrophobia in the dog is not characterized by a constant state of rage from the start, but on the contrary, before the raging period, which is last, a long

time may elapse during which the animal may remain inoffensive, although his disease is already well defined, and susceptible of easy recognition.

This is the truth I wished to bring before you; and I am convinced that if the whole community could understand it, and would remember well the early symptoms, most of the dogs could be isolated before doing any harm. What, indeed, are these wandering dogs which, in the delirium of hydrophobia, attack animals and men, biting and wounding all they come in contact with, spreading consternation on their track? Has this disease—rabies—seized them suddenly, and rendered them so dangerous? Have they contracted it within a very short time? No; without doubt the majority are dogs having good homes, from which they have run away under the impulse already described, and which, for days before their flight, had exhibited some unmistakable signs of hydrophobia. Now let us suppose that, instead of being overlooked, as is too often the case, their malady had been understood; that the owners of sick dogs had taken the precaution demanded by the circumstances—then would the best conditions for the prevention of hydrophobia be realized; for indeed the agents which disseminate it are these runaway dogs, which have been obviously sick for a sufficient time to admit of their being placed beyond harm-doing had their malady being suspected.

#### E.—*Symptoms of Confirmed Rabies.*

In the preceding remarks I have principally endeavored to make clear to you the precursory symptoms of confirmed rabies—that is, that which is characterized by accessions of fury and aggressive acts toward animals and men. I have insisted upon these symptoms, because they are the most important to understand with reference to the safety of the individual. Now I will endeavor to describe briefly the physiognomy, attitudes, and actions of the dog whose disease has progressed

to its furious stage, and has developed in him those rabid instincts which impel him to the fatal bite.

The physiognomy of the mad dog in this stage is terribly modified. His eyes, naturally placid and affectionate when turned upon his master, have now an indefinable expression of dull, ferocious sadness, and flashing glances are thrown by the reflection of the light through his dilated pupils. But when these flashes disappear, the eyes become dull, and so stern, and so ferocious that, when in the presence of such an animal, we can not but feel afraid, even when protected by the strong iron bars of his cell. As soon as he sees you he makes a move toward you, uttering the characteristic bark of the disease. Then he furiously bites the bars which protect you from his attacks, even breaking off his teeth against them. If you present him a piece of wood or iron, he seizes it and bites upon it savagely, but without moaning or barking.

A condition of great lassitude follows this state of excitement. The worn-out animal retires into his cage, and remains for some time insensible to every thing. Then suddenly he rouses himself, bounds forward, and goes off into another paroxysm. But a cause or excitement must exist to bring on the manifestation of these accessions.

When you observe a mad dog in an isolated cage, far from noises calculated to arouse his nervous susceptibility, and removed from the excitement produced by the presence of men and animals, no such furious accessions are seen. At times he is agitated, goes and comes in his box, overturns his bedding, rushes toward imaginary beings, and has apparitions in his dreams, and barks at them. Sometimes, on the contrary, he is quiet, disinclined to move, comatose, exhibiting an intermittence of agitations, without displacing himself, indicative of the fancies which pursue him; but he has no real rage, and only manifests fury when forced to, from external excitements, and of these the most powerful is the presence of one of his own



species. As soon as he sees a dog he rushes at him, and, if caged, violently bites the bars. If another dog be placed in the cage with the rabid one, his first movement is not always to attack him. On the contrary, this poor victim thus thrown in his way awakens in him a feeling of affection, and he shows it by coaxing motions and fawnings of doubtful significance. Then, in an instant, impelled by a different motive, his eyes brighten up with rage, and he falls upon his victim. This one seldom returns the attack, and, uttering sharp cries, contrasting much with the silent fury of his aggressor, he tries to save his head from the bites of the rabid dog. He tries to hide it beneath the bedding, and covers it with his paws. When this paroxysm of fury is passed, the mad dog returns to his fawnings as friendly as before, but only to give way soon after to another accession. When these scenes have been repeated several times, the sick one, worn out, sinks down in a quiet stupor. Rest restores his strength, and then the same thing is repeated, which is periodically renewed until paralysis takes place. This soon comes, as the accessions so frequently repeated greatly accelerate the fatal termination.

I must here call attention to a remarkable faculty which dogs possess, something which seems to tell them of the danger to which they are exposed in the approach of a rabid one. The bravest and the strongest, in the presence of a mad dog, show cowardice and weakness, and instead of attempting to fight with him, they try to escape. If confined with him, even fighting dogs offer no retaliation; they seem to be conscious of the terrible danger to which they are exposed. There are, however, a few exceptions to this rule, of which the following is an example :

I once placed a bull-terrier, a powerful fighter, in the cage of a mad dog. His first emotion was that of fear; but this he quickly overcame, and, instead of waiting for the attack, began the fight himself. With one bound he closed with his an-

tagonist, and seizing him by the back of the neck with his teeth, he threw him down and kept him from doing any harm. This experiment was often repeated with this terrier and other mad dogs, and he invariably came off victorious. In all his fights he avoided being bitten, and never contracted hydrophobia. But, I repeat, this is an exception; ordinarily a mad dog is an object of terror to his fellows. A proof of this is afforded by the behavior of hounds, which, under ordinary circumstances, are more or less surly and snappish toward men. If two of a pack get into a fight between themselves, have a care for the one which shows weakness or fear by his cries, for the others will rush upon him and tear him in pieces. But if the fight arises from the madness of one of the dogs, the others will keep aloof, and will run away if a chance be afforded them. Contrary to their nature, they are suddenly seized with cowardice, and they leave the victim alone with his rabid tormentor. Should this one afterward attack another of the pack, immediately they are both left alone. Strange as these facts seem, they are not the less true. I have observed them quite recently in a kennel, where all the hounds had to be destroyed.

If the mad dog be kept not in a cell, but in a room where his liberty is greater, he moves about in all directions, and his agitation is much greater if he is not used to being away from his master. He is seen or heard roaming about here and there, looking, snuffing, and howling at the walls, rushing at the shadows constantly pursuing him. He gnaws doors, furniture, etc., and at last may find his way through the sashes of a window or the panels of a door. If you are separated from him by a pane of glass only, do not trust such a frail barrier; he will be so much the more inclined to go through it, as the people he sees will excite in him his furious propensity, which he may soon be unable to control.

When a mad dog has succeeded in making his escape, he runs forward at first in a perfectly natural gait, and on his way

attacks any living beings he meets, but decidedly preferring to attack dogs rather than men. He does not, however, long maintain this free way of going. Wearied by the paroxysms of rage; weakened by hunger and thirst incident to the disease, by the disease itself, his feebleness soon shows itself in his limbs, and his steps become slow, his gait staggering. His tail hangs down; his head is carried low, near the ground; his mouth is open; a bluish tongue protrudes, which is covered with mud or dust. All of these taken together cause an appearance entirely characteristic.

In this condition he is less dangerous than before. If he still attacks, it is only, if he finds the opportunity upon his route, to satisfy his rage; but he does not change his direction any more to run after people or animals. No doubt also, his sight beginning to fail, and his sense of smell diminished, he is less impressible by passing objects than before. Soon his exhaustion is such that he can go no farther, and he crouches down in hollows on the road, and remains there for long hours, half asleep. There is danger in awakening him; for, roused from his slumber, and revived by this rest, he may be sufficiently recuperated to attack again. How many children have died from such imprudence!

When a mad dog dies, he does so from the combined effect of a slow paralysis and from asphyxia.

It is not my intention to enumerate or describe particularly the lesions presented by the cadaver of a dog which has died of rabies. At any rate it would not be very useful, for nothing of special value is known which will explain the singular phenomena of that disease.

There is, however, one fact upon which it seems to me it is very important to fix your attention. I allude to the contents of the stomach. As I have already said, hydrophobia induces in one affected by it a strangely depraved appetite. The mad dog swallows numerous substances of no alimentary value. If,

therefore, you discover in the stomach of a dog a mixture of hay, straw, hair, rags, oakum, cord, fœces, leaves, grass, stones, glass, etc., with the remains of food, you may, without danger of being mistaken, pronounce the case one of hydrophobia, for this disease alone will impel an animal of that species to swallow such strange substances. But it may be that these have been thrown up by vomiting, and that only a very small quantity of them is to be found. In these cases the mucous membrane of the stomach still exhibits the evidences of their recent presence. It is highly congested, of a dark, blackish color, and its cavity contains blood mixed with bile. These are indications of great value, as they establish a strong presumption of rabies, and this becomes a certainty when from testimony it is shown that the animal whose stomach was in such a condition had committed attacks upon men or animals.

This terminates what I intended to say about hydrophobia of the dog, with reference to the symptoms exhibited both before and after death.

Now a few words with reference to the same disease in the cat, another animal living in our dwellings in the most intimate manner.

### HYDROPHOBIA IN THE CAT.

The cat may become rabid, but fortunately seldom, set it down, *fortunately*, for the rabid cat is more terrible and more dangerous than the dog. In fact, when a cat is mad the feline nature is thoroughly aroused; the large eyes become staring, and express indescribable ferocity. Nothing is more frightful than to observe one in a cage, the jaws open and foaming, the back arched, and the claws extended. As it walks, which it does with difficulty, its claws clutch the floor and stick into it. If one goes toward it, it will fly at him with one bound as high as the walls of the cage will permit, aiming its blow at the face, for it is this which they attack principally when at lib-



erty. At such times they obey the rabid impulse, and commit cruelties uncontrolled. The rabid cat knows its master no more. This animal, more tamed than domesticated, returns to all its ferocious instincts, and surrenders itself to them. Very different is this from the dog, which is all devotion to his master, and finds in his affections force enough to resist for a long time his ferocious tendencies, which even, as you know, drive him away from his home to satisfy his rage. The cat, also, when mad, disappears, impelled by wildness rather than by devotion, and goes to die in some secluded spot.

It is highly probable, indeed certain, that, like the dog, the cat has a series of precursory symptoms or signs of the approaching crisis; but this disease is so rare in the cat, that I have not been able to observe them at the outset of the disease, and therefore I can not speak of them from personal knowledge. Analogy, however, leads us to suppose that the cat, before becoming aggressive, passes through a period of dull melancholy, of unrest, and of agitation, which strikes the observer so much the more, as the cat is naturally quiet, somewhat sleepy, and the greater portion of the time in uninterrupted rest. Therefore these are indications which would fasten suspicion upon one of this species, which, contrary to its usual habits, becomes at once restless, always moving about without cause, and expressing by its manners and by its countenance, which is somewhat changed, that something serious is the matter. It is never too soon to take precautionary measures by placing the animal out of harm's way, or shutting it up in a cage or cell.

#### PROTECTION.

Here I close my description of the characteristic symptoms of hydrophobia, with particular reference to the disease as developed in the dog. If I have been very particular in stating them, it is because, as I said some years ago in the Academy

of Medicine, in numerous instances those developments of rabies, which so often disturb society, producing inquietude, anxiety, or even deep despair, proceed usually from the fact that the owners or keepers of dogs are ignorant and insufficiently informed, and so unable to detect the first phenomena by which rabies of the dog exhibits itself—a condition almost always harmless at first. They do not know how to take warning by the unmistakable signs given by these animals, and to make use of those precautions by which alone disasters could be prevented. *Ignorance*—this is the cause of the evil; and this is what must be remedied.

So far as I myself am concerned, from that day to this I have endeavored to do it by explaining, as I have done the symptoms of canine rabies. In a communication made to the Academy, the publication of which was very widely circulated, from the fact of the importance of the subject, I have reason to believe that these efforts have not been entirely unavailing, as I will show by a few cases of special interest which have come to my knowledge.

The first one was communicated to me from Trebizond. It is the case of a bitch named Lipa, in which her master recognized hydrophobia under the following peculiar circumstances. He writes: "Day before yesterday I suspected Lipa from hearing her bark, which was peculiar. I carefully closeted her, though as yet there seemed no change in her ways. Yesterday, in nothing did she appear changed from her normal condition, except that she seemed restless and preoccupied when I took her out. I locked her up again, strictly forbidding my servants to let her loose under any circumstances.

"This morning at day-break, against my orders, one of the men, finding that she had a healthy appearance and was as lively as usual, let her loose. Once free, she ran away. By getting upon a roof, and by making prodigious bounds which I can not yet understand, she passed through a window into a house near

by, where she bit a little pup three months old which was resting on a sofa. After that Lipa returned home, while I was yet in bed, and came to me without my being able to drive her away, fixing her wild and terribly expressive eyes upon my hands or my face. Every one in my house had run away, for there was no doubt Lipa was mad. I did not lose my presence of mind, and tried to capture her by kindness. She followed me all about, through the rooms, upon the stairs, on the balcony, in the garden. It was impossible to send her away. At last I succeeded in closing the door upon her in the garden; but soon she began to gnaw and tear the door. A servant then exposed himself, and coaxed her into his own room, which opened into the garden. After a few minutes Lipa jumped through a window six feet from the ground, and rushed into my room in perfect frenzy, staring at my hands as if she wanted to tear them. This time also I remained cool, and made her go out of the room by speaking kindly to her. From that moment I did not hesitate to have her killed. The first bullet pierced her through the chest without her uttering the slightest cry. She then ran wildly in different directions. A second shot brought her down. She was thought to be dead, but she jumped upon the first one who dared to go near her; but two more balls killed her. Some time before, she had bitten her pup with rage and fury, and almost at the same time she rushed out at a mail-carrier and tore his clothes, fortunately without biting him. It was," continued her owner, "an hour of untold anguish. I did not fear for myself; I knew that Lipa would respect me if I did not treat her badly, but I was anxious for the others, seeing her tear whatever she could reach. Her bed was torn to pieces and the door of my room gnawed; she left her traces everywhere she went.

"Lipa had been bitten two months before, as well as her pup, by a bitch which acted suspiciously and was killed shortly afterward. The place of the bite had been washed with

soap and water, and no importance was attached to the incident."

I report these observations, with the details, because from every point of view it is important. Here is a bitch which revealed her disease by her voice, that seemed strange to her owner; which was restless and preoccupied when taken out to walk; which her master shut up as soon as the first abnormal symptom was manifested; which the servant let loose because she possessed healthy appearances; which, once free, ran away and attacked another dog in an adjacent house, and returning home after that access, fixed her staring eyes upon her master, yet was not aggressive toward him; which followed him obstinately; locked into the garden, became wildly mad, yet respected the servant who brought her home again; and again, raving mad, rushed into her master's room, but did not bite him; which attacked her own young one and a mail-carrier, and was shot repeatedly without uttering the slightest complaint. Does not this series of symptoms show that hydrophobia is the same in all countries? But there is something more important than these observations. It is the coolness of the master, the clever manner with which he controlled her by kindness, and the precautions he took to prevent her doing harm—isolation first, death afterward.

This intelligent master of Lipa acted in this way, and thus prevented terrible accidents, for the reason which he himself makes known at the close of his letter. "How fortunate," says he, "that I had read M. Bouley's 'Treatise on Hydrophobia,' and profited by it. Without the warning I had at the outset, I would never have had the slightest suspicion."

I will mention now two other cases in which the description of symptoms of rabies by the public press produced the happy result of having dogs confined which were only in the earliest stages of the disease. These are accounts of dogs brought as suspicious to the hospital of the School of Alfort while I was



professor there. One was a large bull-dog belonging to a wine-merchant. This animal was perfectly quiet, notwithstanding his breed and his fighting habits, and was not aggressive when brought to me. On the contrary, he was extremely fawning; and what made me suspect him at first was, besides the peculiar expression of his eyes, his excessive desire to lick. What roused his master's suspicions was, that the day before he had been persistently gnawing a linen bag which lay near him. Besides this, nothing peculiar was noticeable. But, warned by numerous communications in the newspapers, he realized the importance of this single fact, and thus shut up the dog in a cell in the first period of the disease, while he was perfectly harmless.

The other case is that of a little poodle twelve years of age, to whom his master was much attached. In his letter (sent with the dog to the hospital) he simply said of the dog: "Great agitation for the past eight days; no appetite; affectionate disposition excessively increased; while his master was eating grapes, some fell on the floor; he swallowed them at once; the whole bunch was thrown to him, and he devoured it; when locked in a room, his barks are irregular, jerking, and different from his ordinary voice."

The animal still remained quiet and inoffensive toward every one. Are not these the symptoms which would enlighten an informed person and warn him of his danger? The idea of rabies came to his mind because he had once read the symptoms as described in a newspaper, which he had preserved to peruse again, in case of need.

Having exhibited as well as I can the characters by which hydrophobia can be recognized when in its initial stages, I think it would not be useless to direct your attention to the results obtained from the last Government statistics relative to rabies, and thus give you a glimpse of the dangers to which

communities are exposed by this terrible malady. The statistics cover a period of five years, from 1863 to 1868.

The following facts are collected from the report made to the Consulting Committee of Public Hygiene, to which I belong, but I must say that this is not so complete as it might and ought to be. Thus, out of eighty-six departments, eighty-one only have answered the questions put to them. Forty-nine of the departments have returned one hundred and eight reports affirming the presence of rabid animals in their respective districts, and seventy-seven negative reports, while from one hundred and nine districts no answers have been received. Thirty-two of the departments have declared, by one hundred and fifteen reports, that no cases of rabies have occurred, and seventy-seven districts in these made no response. At least eight of the departments distinguished themselves by a complete refusal to respond.

These omissions are of notable importance, for among the departments, reports from which are missing in one or several years of the period over which the inquiry extends, there are some in which the occurrence of rabid dogs is notoriously frequent. Consequently, it is not possible, I will not say to arrive at a legitimate conclusion, but to make even an authoritative deduction in regard to the influence exercised upon the manifestations of hydrophobia, by the geographical situation of regions where it occurs, or by the local conditions which may prevail.

We must, indeed, admit that the information obtained seems to indicate the reality (to a greater or less degree) of all the cases of rabies reported, rather than the care which the local authorities had taken to collect and transmit the facts to the Central Bureau. There is, therefore, no occasion for attaching implicit faith in the deductions with reference to the greater or less frequency of the occurrence of hydrophobia. Nevertheless, faulty and incomplete as the report is, it is not without results full of interest, of which I present a summary.

1st. In forty-nine departments wherein rabies are reported by one hundred and eight communications, three hundred and twenty persons have been bitten by rabid animals. This figure is enormous, but must be regarded, nevertheless, as far below the truth, for there are departments where the disease is common, and from which no reports were obtained.

2d. Out of the three hundred and twenty persons bitten, the bites caused hydrophobia in one hundred and twenty-nine cases, or a mortality of about forty per cent.

3d. Out of the three hundred and twenty persons bitten, the wounds were not followed by the disease in one hundred and twenty-three known and specified cases.

The established ratio of innocuousness would therefore be about thirty-eight per cent. But we must consider that sixty-eight cases remain, the termination of which have not been reported; a fact which admits of the supposition that for a majority of the bitten people, counting in these sixty-eight cases, the wounds had no fatal results, for the termination by death from a wound by a rabid animal would certainly not escape public notoriety. We may conclude, therefore, that the majority of the cases reported in the investigation, of which the death is not mentioned, the persons bitten have continued perfectly free from the disease.

4th. Among the three hundred and twenty bitten persons, two hundred and six were males, eighty-one females, and in thirty-three cases the sex is not mentioned. This result is perfectly in accordance with those obtained from previous statistics. The number of females is always much lower than that of males, which can be explained only by the fact that they are less exposed, in consequence of their habits and of their household work, to be met by mad dogs; and when exposed to their rage, the character of their clothing offers a means of protection, for the animal satisfies his fury by biting any thing that falls in his way.

5th. Fatal results have not been equal in both sexes. Out of two hundred and six male cases, one hundred, or a little less than half, died; while out of eighty-one female cases, twenty-nine, or a little over one-third, proved fatal. This is forty-eight per cent. in the former and thirty-six per cent. in the latter case. These figures, however, carry with them nothing conclusive.

6th. The age is indicated in two hundred and seventy-four cases, the subdivision of which into a decimal series shows these interesting facts: The greatest proportionate number of bites (namely, ninety-seven out of two hundred and seventy-four) corresponds to the series of five to fifteen years; that is, the age of imprudence, weakness, play, and teasing. Mad dogs would generally avoid and spare children with which they are familiar, were they not excited by the continual irritation that children inflict upon them. This fact is also explained because dogs will meet more children than other persons in the streets and lanes where they collect to play.

7th. Another interesting fact is this, that the mortality is much less in the series where the number of bitten cases is greatest. The ninety-seven cases reported in children from five to fifteen years proved fatal in only twenty-six cases, while in the other series the mortality has been twelve out of twenty-five, twenty-one out of thirty-four, and seventeen out of twenty-eight.

Hence the conclusion that, if children are more exposed, they probably are less predisposed to contract hydrophobia, protected as they probably are by their natural freedom from anxiety, and, consequently, by perfect mental quietude.

8th. The bites have been inflicted by dogs principally, and chiefly by male dogs. Out of the three hundred and twenty persons bitten, two hundred and eighty-four were wounded by male dogs, twenty-six by female dogs, five by cats, and five by wolves. No bite of an herbivorous animal is reported in these documents.



9th. With reference to the distribution of the cases throughout the year, the following facts are obtained: During the three spring months, March, April, and May, eighty-nine cases occurred; during the summer months, June, July, and August, seventy-four cases; during the autumn months, September, October, and November, sixty-four cases; and during the winter months, December, January, and February, seventy-five cases. This leads us to conclude, then, 1. That there is no great difference between the seasons; 2. That the danger from mad dogs in the winter season is about the same as in the heat of summer; 3. That in the spring cases are most frequent, and in the autumn least frequent; 4. That the public opinion which regards winter as free from the curse of hydrophobia, and inculcates summer as causing the disease more than any other season, has no foundation in fact.

This brings us to a conclusion of great importance, namely, that, so far as sanitary measures and the protection of the people is concerned, at all times and in all seasons we should be equally on our guard, and take efficient measures of protection against dogs.

We must, however, observe that although the actual statistics furnish figures indicating an almost parallel number of cases for the seasons of extreme heat and extreme cold, it is due to the greater care in carrying out sanitary measures in summer than in winter.

10th. Concerning the duration of the incubative stage, the statistics give results of great importance, whether viewed by themselves or in connection with previous statistics. Out of one hundred and twenty-nine cases followed by fatal results, the duration of incubation was observed one hundred and six times; and it is shown that the manifestations have been most numerous during the first sixty days, viz., seventy-three cases out of the one hundred and six. The other thirty-three cases are irregularly distributed as far as the two hundred and for-

tieth day, a period of eight months; but they become gradually less and less numerous, so that after the hundredth day the cases are counted only one or two per month, and in the eighth month there was but a single case. Hence the conclusion is, that after a rabid bite the probabilities of escape increase considerably when two months have passed and no rabid manifestations have shown themselves, and that after the ninetieth day entire immunity is almost certain.

No doubt that after this period the danger is not entirely over, and that even then bitten persons are not entirely exempted; but the prospects are more favorable, and great hope may be entertained for their recovery. It has been established from previous statistics that the duration of the incubative stage is much shorter, as the subjects afflicted with bites were more advanced in age. The results furnished lately confirm this conclusion. In comparing the periods of incubation between the ages of three and twenty, we find the average period is forty-four days; and comparing the same between the ages of twenty and seventy-two, we find the average period of incubation is seventy-five days—a marked difference, which is of great importance in prognosticating the possible consequences following rabid bites in the early period of life.

11th. The duration of the disease was recorded in ninety cases, which show that death took place seventy-four times within the first four days—the largest number of deaths corresponding to the second or third day. Life was only prolonged beyond the fourth day in sixteen cases.

Again, the statistics show that death has been the invariable termination of cases of hydrophobia, and that the unfortunate victims have undergone the most frightful mental and physical sufferings, which explains and justifies the terror of hydrophobia which people of all classes entertain.

12th. The documents of the investigation furnish indications full of interest in regard to the more or less innocuousness of

bites, according to the different parts of the body upon which they were inflicted. If we compare the fatal with the harmless bites made upon the same region, we find that out of thirty-two cases where the face was bitten, twenty-nine proved fatal, which gives for these wounds a mortality of ninety per cent. Out of seventy-three cases in which the wounds were upon the hands, they have been fatal in only forty-six cases—harmless in twenty-seven—giving an average mortality of sixty-three per cent. In comparing the wounds of the arms and legs with those of the face and hands, the ratios are inverted; twenty-eight wounds upon the arms were followed by only eight fatal terminations, and twenty-four bites upon the lower limbs gave only seven fatal cases—seventeen remained harmless; showing a mortality of twenty-eight and twenty-nine per cent., and an innocuousness of seventy to seventy-one per cent. And, lastly, the ratio mortality for wounds upon the body is shown as follows: out of nineteen bitten, twelve cases were fatal, and seven bites proved harmless.

These facts, which are confirmatory of those afforded by other statistics, demonstrate also that rabid wounds upon uncovered or unprotected parts, such as the face and hands, are much more readily contagious than those of the arms and legs, which the teeth of the animal can not reach without passing through a portion of the clothing, which wipes off the virulent moisture from the teeth. It is true, the consequences of bites upon the body seem to conflict with this statement. But we must remember that generally these wounds are more severe; that among them some are upon uncovered parts, such as the neck and chest; and that when a man is attacked by a rabid animal and bitten upon the body, he is also bitten upon his hands, which are his natural means of defense.

13th. The information obtained from these statistics is of great interest concerning the means by which it is possible to prevent the terrific effects of rabid inoculation.

If we compare rabid wounds which have been cauterized with those which have not been, we find a notable difference between them. In fact, out of one hundred and thirty-four cauterized wounds, ninety-two resulted harmlessly, and forty-two fatally. That is equal to sixty-eight per cent. in the former, and thirty-one per cent. in the latter case.

In non-cauterized wounds the result is the reverse, and more decided. Out of sixty-six wounds, the mortality is represented by fifty-six, or eighty-four per cent.; and harmless results by ten, or only fifteen per cent.

Now we must observe in relation to cauterized wounds, that it has been impossible, for lack of sufficient data, to make a distinction between them according to the degree of cauterization and the time when it took place, two conditions upon which depend the positive efficacy, or complete uselessness of this means of prevention.

Had these data been given, it is not too much to say that the proportion of properly cauterized wounds which remained without fatal results would have been considerably higher; for the destruction by fire of flesh smeared, and even impregnated, with virulent saliva prevents the occurrence of rabies, we may say *certainly*, where it is done in time; that is, before the fluid deposited in the wound is absorbed.

F.—*The best Means for preventing the Effects of Rabid Inoculations.*

I naturally find myself brought to speak to you, not of the means for curing hydrophobia, for unfortunately, as yet, we have none, but of what must be done to prevent the inoculations being followed by fatal consequences.

From the documents already mentioned, it is proved that the cauterization of the wounds with red-hot iron, made with the greatest thoroughness, and in the shortest possible time after the inoculation, has proved the most certain prevention.



I can not say, and I fear it would be temerity to attempt to indicate, within what limit of time the absorption of virulent saliva takes place when brought in contact with a wound by a bite, or otherwise. The results of experiments in this direction are not as yet sufficient to enable us to decide understandingly. But what can be said without fear of mistake is, that cauterization can not be applied to an existing wound too soon, that the red-hot iron is preferable to all other means, and that it is better to apply it in excess than in a timorous way.

This operation does not require, positively speaking, the services of a surgeon, at least not when the wounds are superficial, or when, having penetrated only to a moderate depth, they are altogether in the flesh.

It is easy to improvise instruments which may be used for this purpose: an iron bar, a fluting-iron, a poker, any rod of iron in fact, even the blade of a knife or those of a pair of scissors, all may answer the purpose; but it is preferable if the object is round rather than flat, for it holds and retains the heat better. In using it, the iron must be heated to a *white heat*, and when applied to the wound it is to be held there with a firm and steady hand, carefully turning it through the whole length and to the full depth of the wound, for absolute certainty. The cauterization being done once, it is well to repeat it a second time.

The intensity of the pain is here of secondary consideration: no matter how intense the sufferings of the moment may be, when we consider the importance of the object at stake. Indeed, people generally have a greater bread of the pain thus caused than there is any occasion for. This pain is entirely endurable, especially when the parts in immediate contact with the cautery are carbonized. It seems, indeed, if I can credit the report made to me by M. Leblanc, of Paris, who spoke from personal experience, that cauterization of a rabid

wound would be, I will not say pleasant, but not without a certain satisfaction resulting from the idea of the good that it will secure, and this feeling it seems the patient carries in his mind.

When a cautery is needed and the hot iron can not be obtained immediately, one may cauterize the wounded parts by using gunpowder, as appears from information received by the Academy of Medicine through a M. Maniere, who for fifteen years lived in Hayti. Rabies is a frequent disease in that climate, and is observed in all seasons, but it is not followed by fatal results in proportion to the number of bites, because every one there appears to know the way to prevent it. As soon as a wound is received it is filled with gunpowder; this is ignited, and thus a very efficacious cauterization is instantly produced, which can be applied at once, the powder being easily obtained.

This application is followed by that of blisters, and the patients submitted to mercurial treatment and salivated. The author of this statement asserts that, although rabid bites are common in Hayti, he has known or seen only one person who succumbed to hydrophobia, and he had refused to employ the common cauterization used in the country.

This method presents the advantage of easy and immediate application under many circumstances where cauterization with the hot iron can not be used. It is a precious means, and well worth remembering.

Though fire be considered the best agent for destroying the virus left in a lacerated wound by a virulent tooth, it must not be understood that other agents are inefficient, and that without it there is no hope.

The object in view is the destruction in the most rapid way of the tissues touched or already impregnated with rabid saliva. If, in the impossibility of having fire at hand to apply directly, or even gunpowder, one has a caustic of some kind,

such as strong nitric acid (*aqua fortis*), sulphuric acid (oil of vitriol), muriatic acid, or nitrate of silver, butter of antimony, corrosive sublimate, it must be used at once, without delay, and with all the severity of which the organization of the parts will admit, with the intention of applying the actual cautery afterward as soon as the opportunity presents itself.

I can not insist too strongly upon the absolute necessity of energetic applications of preventive measures, for the statistics exhibit data showing many proofs of useless practices, which are too often applied. Numbers of times, indeed, it is shown in these reports that the treatment of a rabid wound has only consisted in the application of ammonia, alcohol, or nitrate of silver too superficially, or only some vinegar; that once done, any other local application was dispensed with, the means thus employed being regarded as sufficient. In numerous cases, also, it is shown that, for lack of any substances to apply, persons abstained from any interference with the wound before the time when the iron or some caustic agent could be applied. Often in such cases too long a time had elapsed between the application of the treatment and the time the bite was received. What, then, is to be done in such cases?

When far away from any assistance, and when one has no efficient agent to apply to destroy the virulent fluid which may have been introduced into the wound, one must not remain inactive, and it is possible, by using special discretion, to retard the absorption, if not to prevent it.

The first means which may be preventive, if applied without a moment's hesitation, is the prompt suction of the wound. This the bitten person, in many cases, may apply at once himself, when the wound is convenient for him to reach with his mouth. The blood which flows under the influence of the sucking of the lips brings away with it the virus which may have penetrated within the capillaries of the wounded parts. The chances of the absorption of this liquid, if not destroyed,

are at least considerably reduced. No doubt it may be said, as an objection, that if in this practice the virus is not absorbed through the wound, it may be through the mouth, the mucous membrane of which is so delicate. But this danger may be avoided, if after each application of the mouth to the wound the liquid is immediately ejected. Under any circumstances, it seems that in such a case there should be no hesitation on the part of the sufferer in considering what he has to do, for most certainly the chances of absorption of virus are greater through the surface of a flesh-wound than through that of a healthy mucous membrane; but if under the specified conditions the chances of absorption of the virus through the surface are small, I would not dare to say that they are entirely negative; neither could I recommend suction as a general practice in the case of persons not in danger.

I can only recommend it as a means always at hand, and ready to be applied when any other can not be had, and as one which might prevent the terrific danger to which bitten persons are exposed; yet I fear the responsibility of the results to those who, urged by affection, might have recourse to its employment for the benefit of one near and dear to them.

To prevent the effects of rabid wounds, one may almost invariably have recourse to pressure of the wound itself, so as to excite bleeding, and by means of the blood to wash out and carry away the virus. If at the same time it is possible to submit the wound to continued washing with any liquid, though it be nothing else but urine, this means ought not to be neglected. *Javelle* water,\* so frequently used in house-keeping, may in such cases be very useful. It is well, also, to submit the edges of the wound to severe pressure, in order to close up the capillary blood-vessels, and thus arrest the circulating current—a necessary condition for absorption.

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\* Chlorinated soda, or “chloride of soda.”



Whenever the situation of the wound will admit of it, it should be surrounded by a ligature bound so firmly as to prevent local circulation, and thus diminish the absorption. The ligature must not be removed until caustics or the cautery has been applied, and it will always be a good precaution to keep it on until by the application of numerous "cups" the greatest possible quantity of blood has been removed from the parts inclosed by it. Such, then, is the summary of the measures necessary, or at least useful, to employ for preventing or diminishing the dangers following wounds received from rabid animals.

There are thousands of receipts of secret remedies, of different practices, which are commonly used in many parts of the globe. I will not examine the therapeutic value of those means, more praised than others in locations where they are consecrated, as it were, by tradition; but I must say that, whatever they may be, they should not be neglected—there is no advantage to come from doing that.

It is certain that no positive remedy for rabies has hitherto been discovered, when this rabid virus is once introduced into the blood. All that medicine can do is to destroy the virus in the wound where it is deposited by the virulent tooth. Beyond this we know of no efficacious treatment. The unfortunate person who is threatened with hydrophobia passes a long period of days, or even months, through the perplexities, anguish, and even mental tortures of one condemned to death. He has ever before him an implacable spectre of—possibly, to-day, probably to-morrow—a fearful reality. In such a condition of mind, how important is it that he should have somewhere to look—no matter where—for motives not to despair, for means of obtaining a little quietness, a little rest. Who can say that the quietness of his mind, that his faith and confidence in some particular measures, are not for him the only means of safety?

Statistics prove that in an equal number of subjects—children and adults—exposed to hydrophobia on account of virulent bites, less victims are included among the former than among the latter. Does not this result indicate that the state of mind of the patient has some influence upon the development of the fatal symptoms? Personally I am convinced that all practices and medications, whatever they may be, which are directed to the *morale* of inoculated persons may afford very useful assistance. Sometimes I have administered to persons under the influence of the terrors of apprehension, expecting the development of hydrophobia, innocent purgatives as positive specifics, and the pleasant remembrance I have of their immense satisfaction renders me still confirmed in the belief that in such a case it is wrong to attempt to destroy faith in such remedies; more than that, it is positively advisable to apply them.

But these means which constitute the *mental* treatment, to a certain degree, must not take the lead of those, the *material* application of which is certainly efficacious when used in time and in a proper way. This would be a great error, against which I must put you on your guard.

I sum up every thing in saying: In the presence of a rabid wound one must immediately, without losing a moment, prevent the absorption of the virulent saliva by squeezing the edges, by washing the wound, by suction with the mouth and with the cup, by the application of the ligature, and as soon as possible by cauterization with the actual cautery or some chemical agent. One must never abstain from the local treatment of the wound by the powerful means I have prescribed. This treatment must be applied at once and before any other. This done, there is evidently no harm or wrong, there may even be advantage for the patient, in going about to inquire for means or remedies of any kind, and wherever they may be found. When all that is absolutely necessary has been done, what remains and is essential, is to secure the

mental quiet of the patient, as all the facts tend to prove that less opportunity is afforded to the disease in proportion as the nervous system is less excited by fears of the future.

In reference to this I may observe that the most recent statistics, as well as earlier ones, furnish figures which may have a very salutary influence in the moral treatment of hydrophobia. They show that a rabid wound is not necessarily fatal, as many are prone to believe, but, on the contrary, that more than half of the cases give rise to no fatal consequences. I will add that in the future the number of harmless cases of rabid wounds will increase so much more, as the immediate use of means to prevent the absorption of the virus from the wound where it has been deposited will be more thoroughly practiced. Prevent this absorption—that is the important point to be attained; for when the disease is once pronounced, death is inevitable, or at least such has hitherto been the result.

No remedy being known against hydrophobia, the best thing to do is to endeavor to diminish the sufferings of those who are afflicted with it, and to shield them from mental torments, by the constant use of anæsthetics under all forms and by every means. As they must die, it is doing them great service in giving them at the same time unconsciousness of their condition and insensibility to their sufferings.

Now, to conclude, ladies and gentlemen, it remains for me to give you an idea, from the data furnished by the statistics, of the number of animals of the canine species which were bitten by dogs or wolves, and from this to estimate the chances of people being exposed to be bitten by rabid animals.

The number of dogs reported bitten is seven hundred and eighty-five, of which number it is shown that five hundred and twenty-seven were destroyed, and of the two hundred and fifty-eight remaining, we know the end of twenty-five only. These were isolated, and of them thirteen contracted the disease. These figures are far from giving the exact number of dogs

bitten. They only record the number which came to the knowledge of the local authorities, and upon these the data previously considered were based. Such as they are they have, however, an important significance.

The fact is established that, out of the whole number known to have been bitten, nearly one-third—twenty-nine per cent.—seemed to have escaped all sanitary precautions, such as isolation or slaughter; probably through the incompetency, ignorance, or the kindly disposition of the authorities to whom the duty is intrusted; and also through the indifference of the exposed population, who ought always to be the first, if they understood their own interests, to claim protection through the application of those sanitary safeguards established by law.

The need of the public (to have the laws well enforced), which is not appreciated by the people, is demonstrated by the facts above stated—namely, that out of twenty-five whose isolation was accomplished, half contracted the hydrophobia. If we admit that the same ratio held with the two hundred and thirty-three which ran free, although infected, then one hundred and sixteen must have become the means of propagation of that terrific disease; and there is no exaggeration in the assertion that each one has made of his own species at least ten victims, and these also themselves have propagated the disease. For this reason hydrophobia is chiefly confined to dogs, and the number of infected animals accordingly goes on increasing in a fearful ratio. But if the authorities were vigilant, and the people more anxious for their own protection, it would be possible, without great difficulty, to reduce the disasters to a very small proportion, as well as the irreparable accidents where it attacks man.

Let us observe particularly that the occurrence of spontaneous hydrophobia in the dog is very rare. In the vast majority of cases the disease proceeds only from contagion. Out of one



thousand mad dogs, at least nine hundred and ninety-nine took it from a bite.

*Contagion.*—This is the great cause, the one which must be extinguished, at least the effects of which must be circumscribed within the smallest possible limits. It is clear that this result would be obtained if whenever a mad dog passed through a locality, all the animals he might have bitten were well known, and placed in a quarantine of no less than *eight months*, or else destroyed, which would be still more efficacious, for thus the disease would certainly be destroyed before having produced any fruit. I do not conceal the fact that there are numerous difficulties to be encountered in the carrying out of these measures. Nevertheless they are absolutely necessary to produce the desired result—namely, the entire extinction of rabid contagion—and should be carried out with all firmness.

In a great number of cases the dog is to man more than a mere animal. He is a being to whom he is attached by a strong friendship: to many he is one of the family; he is the favorite of the children; he may be a valued souvenir, and one can easily conceive such a condition of things existing that it would be exceedingly difficult to obtain his master's consent to a verdict of death. The quarantine remains; but unless it is carried out in a particular establishment, there will be obstacles which will prevent its being enforced with strict rigor. During the few first days after all the terrors of hydrophobia are brought to the mind, the bitten (or suspected) dog is subjected to the closest watching, and is kept securely chained or confined in a room, with the promise of a strict quarantine; but as time passes the dangers are forgotten, fears of the future disappear, and soon he is left free. This, too, just at that very time when he is most dangerous—that is, when the period of incubation has passed, and when the appearance of the disease is imminent. It occurs to no one that the animal is allowed his freedom too soon. His master believes that there is no more

danger; the people of the locality have forgotten about it; the authorities, either by ignorance of what may happen, or by neglect of their duty or fear of being obliged to execute it, take no notice of the dog being free; and yet we are liable to witness the propagation of rabies through this animal.

Bear in mind that out of twenty-five dogs which had been bitten and were quarantined, thirteen became mad. How large the proportion! and how forcibly it shows the necessity against bitten dogs of those severe measures which alone can absolutely prevent their doing harm. And so long as quarantining is so often useless, while the immediate slaughter of all suspected dogs is an absolute condition of security to the inhabitants, I believe that humanity demands the decision which must be made. In fine, it is better to resign ourselves to kill the dogs than to run the chance of being killed by them.

If, however, this course seems too severe (and we must expect that some people will regard it so), there is, I believe, an excellent means of obliging owners of suspected dogs to have them killed—namely, holding them pecuniarily responsible for all the disasters they may commit. No new laws would be required (in France) to obtain this result. It would only be necessary to impose and enforce police regulations, making it necessary for all owners of dogs to have upon them collars giving their own names and places of residence. Were this measure carried out to the letter, both at home and on the road, should one of these animals cause accidents, the articles 1382, '83, and '85 of the civil code may be applied against the master. These articles provide—1st. That if any person causes damage to another by his own act, he shall repair the same; 2d. That every one is held accountable for the damage he has caused, whether the same be by his own act or by his negligence or imprudence; 3d. That the owner of an animal, or one who uses him, while he does so is answerable for all damage caused by the animal, whether the said animal be un-

der control, lost, or have run away. As the damages in case of death by the bite of a rabid dog may and ought always to be laid at a considerable amount, I am convinced that in the greatest number of cases owners of dogs would prefer to have their suspected dogs destroyed, than take the chances of so heavy a responsibility.

Those articles, then, of the civil code may and ought to be entirely efficacious as a means of preventing hydrophobia. It suffices to take advantage of them in all the circumstances when it would be possible to hold the dog-owner responsible; for, generally speaking, no matter how great love a man may have for his dog, he has still greater for his purse.

Personally I have greater confidence in these laws as sanitary measures than in the most thorough muzzling of the dogs, which is made obligatory by numerous ordinances that are nowhere properly executed. We may even say that, as a means of preventing hydrophobia, this last measure is useless, and in fact never applied to those which are capable of making mischief from the fact of their rabid condition. A few words will demonstrate this:

What dogs are they which, in the streets or on the roads, show themselves to have the hydrophobia, and bite the people and animals they encounter? Were they but a moment ago in the most perfect health? Has this rabid temper suddenly developed itself without premonitory symptoms? No, certainly not. These dogs were already affected, and have had the disease in a latent state for several days at home; and if they are now wanderers upon the road, it is because they have escaped from home in obedience to the instinct which urges them to run away from those they love. Generally it is unknown to all that they have escaped, and consequently they always go unmuzzled, for it is never customary to keep dogs muzzled at home. What good, then, can be derived from this muzzling as a prevention of hydrophobia, so long as it is the rabid dogs

which are sure to go unmuzzled, and those which are subjected to it are in perfect health?

In closing these remarks, I can not better impress the subject deeply upon your minds than by recapitulating those distinctive characters of canine rabies, the knowledge of which is so important; for you are aware that it is before *rabies* becomes raving, and exhibits this harmless character for several days, that, for one who understands the significance of symptoms, it would always be possible to place the dog where harming would be out of the question.

### RESUMÉ.

*Indications of the distinctive Symptoms of Hydrophobia in Dogs in its different Stages, and of the Means of preventing its Propagation.*

1st. Rabies in the dog is not characterized by raving madness in the first few days of the attack. On the contrary, it is a disease of a gentle type at first; but from the first the saliva is virulent, that is, it contains the germ which may inoculate hydrophobia in other animals, and the dog is thus more dangerous by his affectionate demonstrations than by his bites, for at this time he has no desire to bite.

2d. From the time that hydrophobia begins to affect the dog his disposition changes. He becomes sad, dull, and morose, likes to be alone, and keeps himself in dark corners; but he can not remain long at rest in the same place. He is anxious and agitated; goes and comes; lies down and gets up; goes out, smells about, looks around, and scratches with his forepaws. His motions, attitudes, and actions seem to indicate at times that he sees phantoms, for he bites in the air, rushes forward, and howls as if ready to fight real enemies.

3d. His expression of countenance is changed, and his looks betoken a dull but ferocious melancholy.



4th. But in that state the dog is not yet aggressive toward man. His impulses are what they were before. He is obedient to the voice of his master; he even manifests signs of pleasure; and this his countenance exhibits at times as it returns to its natural expression.

5th. Instead of being inclined to bite and fight, he exhibits the contrary tendencies in this incubative stage. The friendly and affectionate feeling which he has toward his master and the friends of the house is exaggerated, and he shows it by the repeated movements of his tongue, with which he is anxious to caress the hands or face of those he can reach.

6th. His affectionate feeling, so much developed and so strong in the dog, is sufficiently dominant in him, that in numerous cases it impels him to respect his master even in the paroxysms of his madness. It is so strong that owners of dogs have often a powerful influence over them, even after their furious impulses have the mastery over them and they have given themselves up to them.

7th. The mad dog is not afraid of water; on the contrary, he is anxious for it. As long as he can drink he satisfies his intense thirst, and when the spasms of his throat prevent his swallowing, he will thrust his whole face into the vessel which contains the liquid he can not swallow. Thus the mad dog does not *fear water*.

8th. The mad dog refuses no food in the early stages of the disease. He often eats with more appetite than usual.

9th. When the desire of biting (which is one of the essential characters of hydrophobia at a certain period of its manifestations) begins to show itself, the dog satisfies it upon inanimate bodies. He gnaws the wood of doors and furniture, tears carpets, curtains, slippers, chews straw, hay, hair, and wool, eats earth, the dung of animals, his own, etc., and thus accumulates in his stomach a mass of the remains of these things.

10th. The abundance of the flow of saliva is not a constant symptom. Sometimes the mouth is moist, sometimes it is dry. Before the occasion of a paroxysm the saliva is natural. It increases somewhat during that period, and diminishes toward the end of the disease.

11th. The mad dog often expresses the pain caused by the spasm in his throat by rubbing his fore-paws upon his throat as if he had a bone stuck in it.

12th. In a variety of hydrophobia in dogs called *Dumb Rabies*, the paralyzed lower jaw remains set, apart from the upper one. The mouth, thus kept open and dry, has a brownish-red appearance overspreading the lining membrane.

13th. In some cases the mad dog vomits blood, caused by wounds in the stomach from the sharp bodies he has swallowed.

14th. The voice of the mad dog changes always in tone, and his bark is always different from his habitual one. It is hoarse, prolonged, and becomes jerky and howling. In the dumb rabies this symptom is missing. This form of the disease is so called because the patients are absolutely mute.

15th. Sensitiveness to pain is greatly diminished in the mad dog. When whipped, burned, or wounded, he does not cry nor utter any complaint; and when thus treated he does not even whine. There are cases where the rabid dog inflicts upon himself deep wounds with his teeth; and thus, as it were, vents his rage upon himself, and this without attempting to hurt those with whom he is familiar.

16th. The rabid dog is always very violently impressed and irritated by the sight of animals of his own species. As soon as he comes into the presence of one, or when he hears his bark, his rage is roused. If previously latent, it develops itself; and if already developed, he rushes at him to tear him with his teeth. The presence of a dog produces the same impressions upon other animals of different species when they

have the hydrophobia; so that we may say that the dog is a sort of reactive agent, by which we may always, with very great certainty, detect hydrophobia while it is still latent.

17th. The mad dog runs away from home when, in the course of the progress of the disease, his ferocious instincts develop themselves and begin to overcome his will. After one, two, or three days of peregrination, during which he has vented his rage upon all the animals and persons he has encountered, he returns home to die near his master.

18th. When rabies is at its furious period, it is characterized by an expression of ferocity in the countenance of the animal thus affected. His desire for biting is satisfied whenever it is possible, but it is always upon one of his own species in preference to any other animal.

19th. The disease exhibits itself by accessions of rabidness, in the intervals between which the exhausted animal falls into a comparative state of quietness, which may be deceptive as to the true nature of the disease.

20th. Healthy dogs seem to have the power of perceiving when an animal of their own species is rabid, and instead of fighting they endeavor to escape from his bites.

21st. The mad dog when at liberty, and during his paroxysms of rage, attacks at first with great energy all living beings he encounters, but always prefers to attack dogs. Then, when exhausted by his paroxysms and his battles, he walks away in a vacillating gait, easily recognized by its peculiarity, with his head hanging near the ground, his tail drooping, his vision defective, his mouth open, and with bluish dirty saliva drooling from it. In this state he has no special tendency to bite, but yet attacks men or beasts who may come in his way.

22d. The mad dog which dies by the natural course of the disease succumbs to paralysis and asphyxia. To the last he

is controlled by his desire to bite, and he must be feared even when apparently inert through exhaustion.

23d. At the post-mortem examination of a rabid dog, we find in the stomach the incongruous mixture of substances already enumerated, having no nutritive value, and their presence has a decided value in indicating with considerable certainty that the dog died of rabies.

24th. The surest way of preventing the effects of rabid inoculation from the bite of a mad dog is the immediate cauterization of the wound with the actual cautery, or with burning gunpowder, or some other caustic agent. The sooner and more thoroughly this cauterization is made after the wound is received, the greater the security.

25th. If the cauterization can not be done immediately after the bite, one must, while waiting, wash the wound, press it very thoroughly to squeeze the blood out, suck it with the lips, spitting out the liquid immediately, compress the edges of the wound, and, if possible, apply a ligature about the limb to arrest the circulation of the blood.

26th. After using these preventive means, which must always be applied at first, one may pursue with advantage any approved treatment recommended for rabid bites.

27th. The principal and we may almost say the only cause of rabies being its transmission by the bites of rabid dogs, all bitten dogs, or those suspected of having been bitten, must be placed where they can do no harm, either by absolute quarantine of at least *eight months* or by immediate death.

28th. Owners of rabid animals are responsible, legally, for the injury they cause to the persons or property of those who may be sufferers by them, as shown by articles already cited from the civil code.

29th. All dogs ought always to wear, at home as well as abroad, collars having their owners' names and addresses upon them.



My task is now accomplished. I undertook it because, as I told you when I commenced, I had the assurance that I would be doing a useful thing. I conclude with the same conviction, and I do not think that I am in error, for I believe that you agree with me.

THE END.



# HYDROPHOBIA:

MEANS OF AVOIDING ITS PERILS AND  
PREVENTING ITS SPREAD,

AS DISCUSSED AT ONE OF THE SCIENTIFIC  
SOIREES OF THE SORBONNE.

By H. BOULEY,

MEMBER OF THE INSTITUTE OF FRANCE, GENERAL INSPECTOR OF THE  
VETERINARY SCHOOLS OF FRANCE, ETC., ETC.

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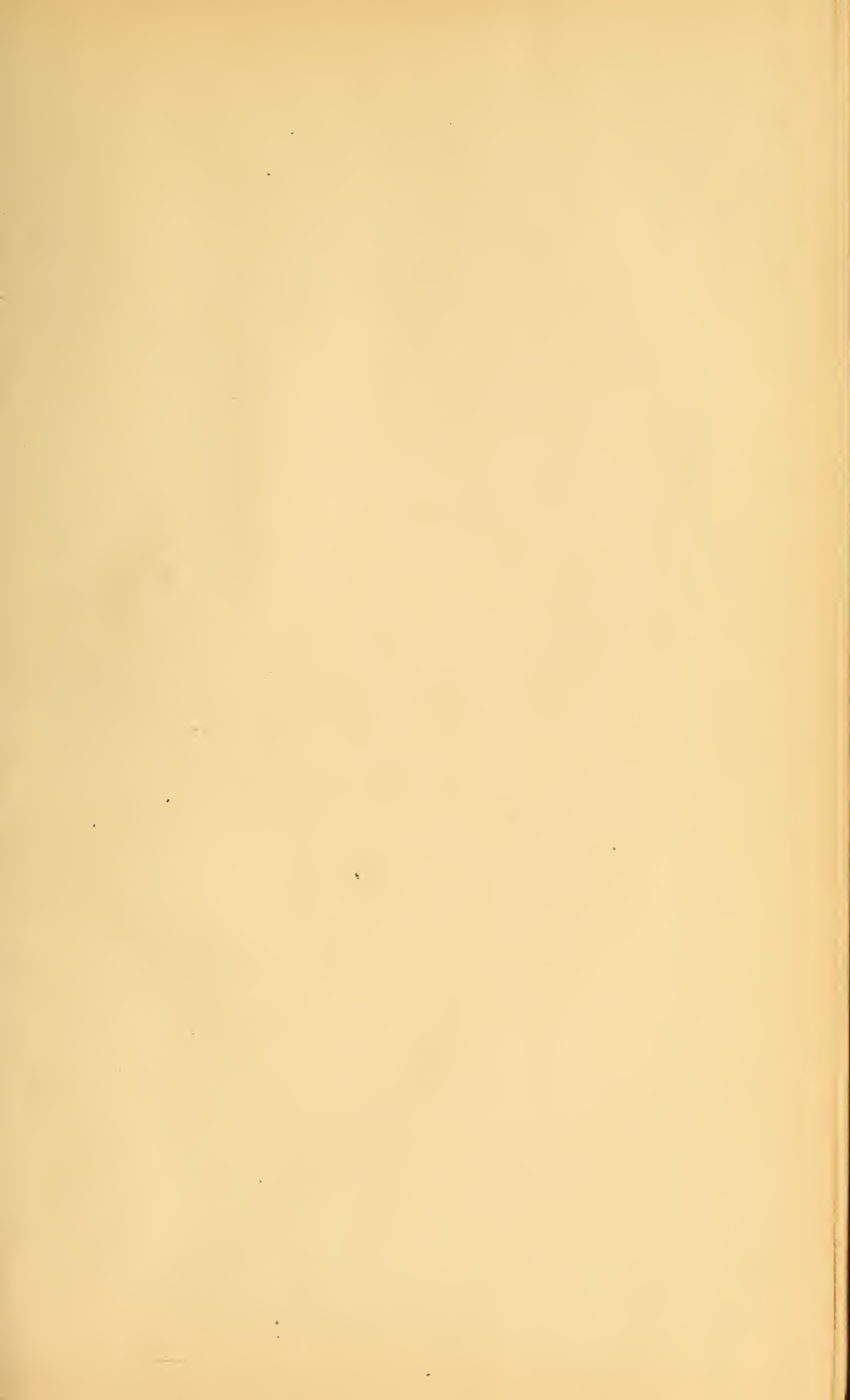
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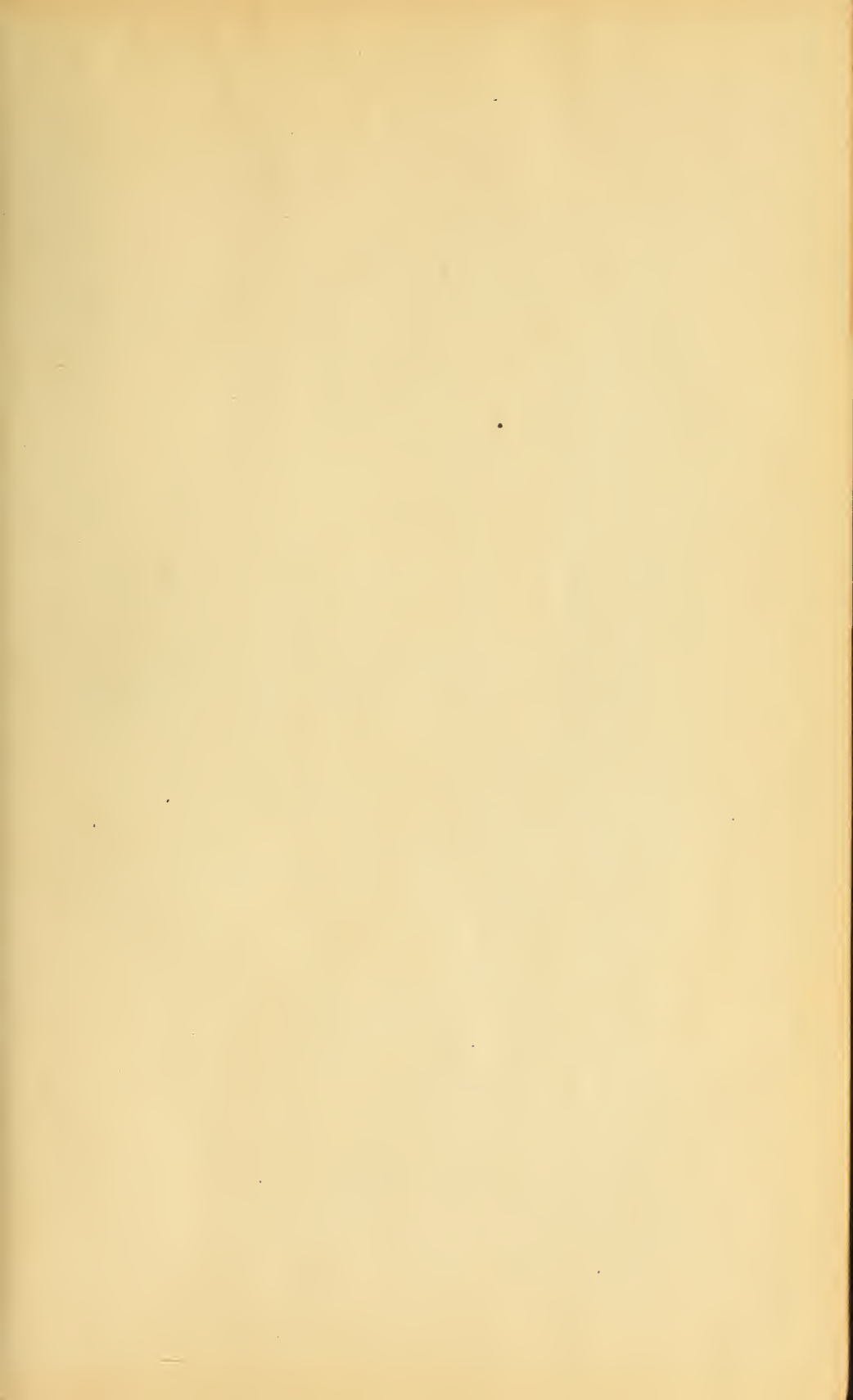


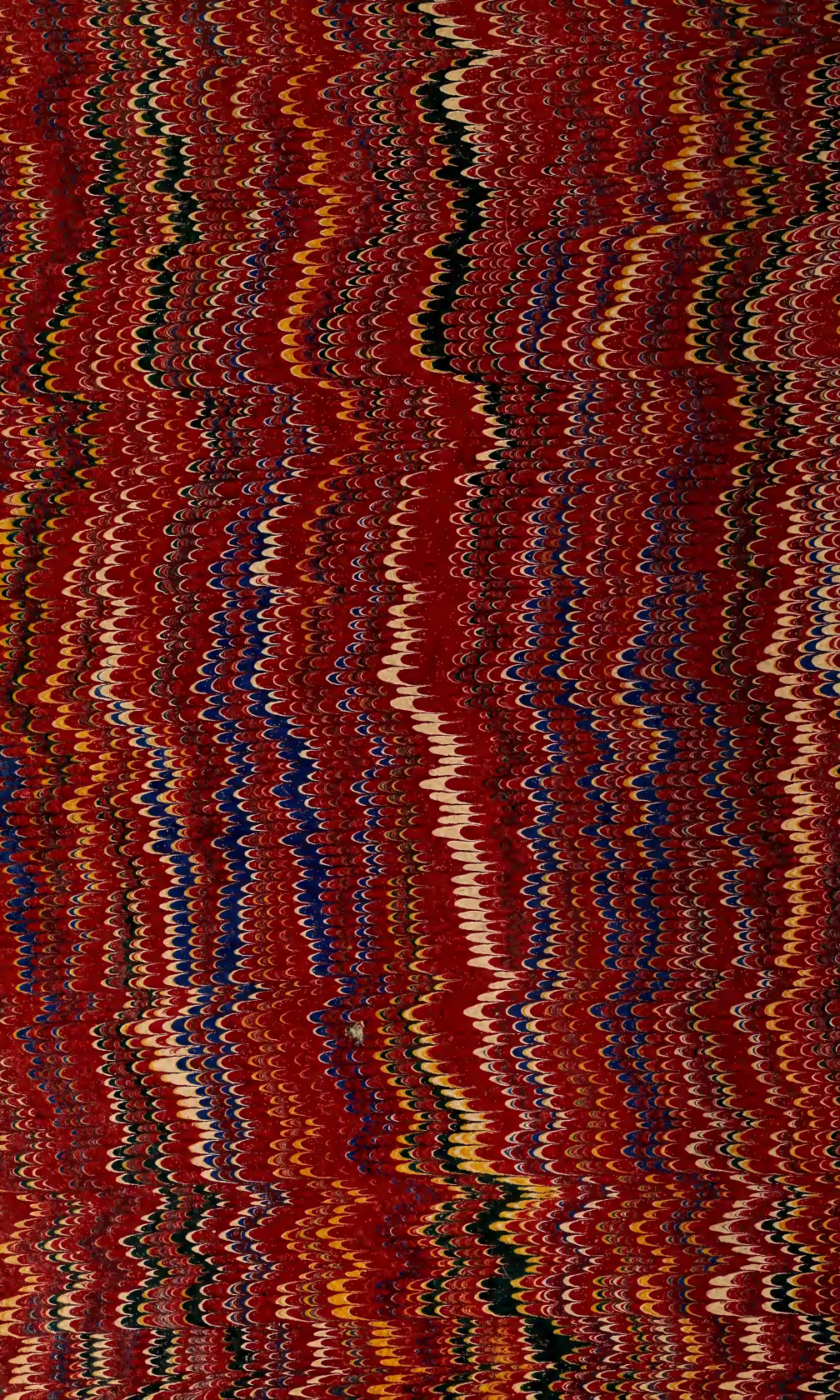


















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